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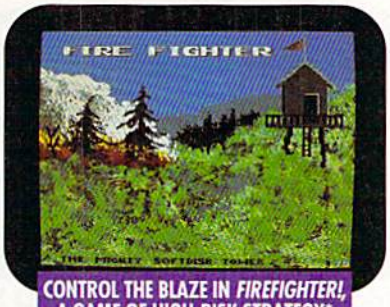

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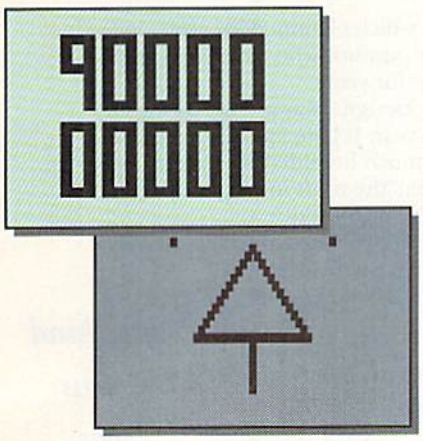

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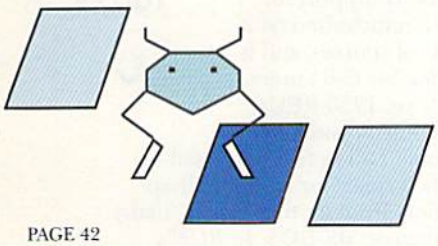

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RUNNING RUMINATIONS

SOME PONDERABLES

1991 will go down as another year in which Commodore users once again defied the predictions of industry pundits, who have been forecasting the demise of the 64/128 market for years.

In fact, one company, Creative Micro Designs, was as busy as the air traffic over the Persian Gulf earlier this year. It launched a stockpile of new products and began to deliver the much heralded RAMDrive and RAMLink. A *RUN* reviewer dubbed them"the most intelligently created third-party Commodore hardware I've ever used."

And who would have thought that your C-64 *manual* would actually increase in value: $300 (towards the purchase of an Amiga)? Or that the C-64 could be expanded to two megs?

ANOTHER YEAR, ANOTHER CEO

What kind of year was 1991?

On the eve of America's quincentennial, Columbus bashing was all the rage. Meanwhile, Commodore bashing subsided as users appeared resigned to the company's move away from the eight-bit market to the Amiga and CDTV lines. In contrast, Commodore reintroduced support for the C-64 with a program that promised a refurbished 64 if you sent them your broken one and $64 (of course), and it reopened its customer service support line for C-64 users.

Still, products such as the 1581 disk drive, 1750 REUs and 128s were as scarce as viable Democratic presidential candidates; and you didn't have to be Anita Hill to feel harrassed in 1991: 64/128 owners watched as their shelf space for software disappeared. Like Baltic republics breaking away from mother Russia, many user groups shifted allegiance to the Amiga or MS-DOS. In *RUN*'s user's group update section, however, new countries were heard from.

While Commodore's fortunes waned in the U.S., they waxed in Europe, where, according to its mid-year report, the company realized 85 percent of its overall sales. And while sales sailed off to Europe, a number of European games made their way to our shores.

Speaking of fortunes, Commodore settled with ousted leader Harry Copperman for millions, and installed Jim Dionne as its U.S. head.

REPEATS & HERESAY

While George Foreman made a comeback in the ring, and Liz Taylor tied the knot—again—two software companies revived their long-running successes: Timeworks introduced version 6 of its venerable Word Writer, and Origin released Ultima *VI*. Even game cartridges reappeared as Commodore dusted off some oldies and ReadySoft readied Wrath of the Demon.

In the rumor category, the Commodore world buzzed with talk about a grassroots effort to sell a new accelerator chip for the C-128.

In response to readers' beefed-up telecommunications activity, *RUN* upgraded its BBS to a multiuser system. And the ReRUN disk took on a new look with an easy-to-use interface and new features.

Before they close the book on eight-bit computing, the C-64/128 will write a few more chapters. *RUN* will be here—in its bimonthly format—covering those events and helping users get more out of their systems. As we enter our ninth year, we have an amazing group of writers, reviewers and editors who look forward to bringing you the best articles and programs. So join us in '92!

Dennis Brisson

Dennis Brisson
Editor-in-Chief

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MAGIC

Learn how to speak like an executive, hide files in GEOS and reset your 64 without losing the Basic program that's loaded into memory.

Compiled by TIM WALSH

$5DD BUZZWORDS 64/128

Listen carefully to government and business officials when they're interviewed on television or radio, and you'll soon notice they communicate in what is known as "empty rhetoric." Generally at a loss for meaningful words, elected officials often use words and phrases not for their meaning, but rather for their impressive sound.

Just type in the listing using *RUN*'s Checksum in either 64 or 128 mode. When run, Buzzwords 64/128 lets your C-64 or C-128 generate a steady stream of such phrases. They won't make a lot of sense, but they'll provide you with an executive's vocabulary.

```
Ø REM BUZZWORDS 64/128 - RON PRESCOTT
                                        :REM*19Ø
1Ø DIM X$(5):DIM Y$(5):DIM Z$(5)        :REM*2Ø9
2Ø B$="BUZZWORD PHRASES"                :REM*2Ø1
3Ø PRINT,B$                             :REM*1Ø3
4Ø PRINT:PRINTCHR$(14)                  :REM*18Ø
5Ø LET X=INT(RND(1)*5)+1                :REM*239
6Ø X$(1)="INTEGRATED"                    :REM*9Ø
7Ø X$(2)="TOTAL"                        :REM*2Ø1
8Ø X$(3)="SYSTEMATIC"                   :REM*155
9Ø X$(4)="SELF-CONTAINED"               :REM*179
1ØØ X$(5)="QUASI-FUNCTIONAL"            :REM*126
11Ø LET Y=INT(RND(1)*5)+1                :REM*46
12Ø Y$(1)="MANAGERIAL"                  :REM*241
13Ø Y$(2)="ORGANIZATIONAL"              :REM*188
14Ø Y$(3)="MONITORED"                   :REM*152
15Ø Y$(4)="RECIPROCAL"                  :REM*227
16Ø Y$(5)="HALF-LIFE"                   :REM*19Ø
17Ø LET Z=INT(RND(1)*5)+1                :REM*96
18Ø Z$(1)="BUDGETARY OPTIONS."           :REM*56
19Ø Z$(2)="FLEXIBILITY."                :REM*18Ø
2ØØ Z$(3)="CAPABILITY."                  :REM*59
21Ø Z$(4)="STABILITY."                  :REM*237
22Ø Z$(5)="TRANSPARENT LAYERS."         :REM*63
23Ø EN$=CHR$(14):A$=" " :B$="{SHFT L}ET'S
    IMPLEMENT":C$=" "                   :REM*29
24Ø PRINT{2 SPACEs}B$;A$; X$(X);C$;Y$(Y);C
    $;Z$(Z)                             :REM*73
25Ø FORT=1TO12ØØ:NEXT:GOTO4Ø            :REM*49
```

—RON PRESCOTT, MODESTO, CA

$5DE IMITATION RESET 64

Imitation Reset 64 is just that—an imitation of a "real" system reset. After the program is typed in and run, entering a SYS 49152 from either Direct or Program mode causes the screen to briefly freeze, shrink a few pixels in size on all four sides, then reset itself. The all-too-familiar Commodore 64 startup screen appears in a few seconds.

Unlike a "real" reset, however, this program leaves Basic programs undisturbed in memory after the reset! By placing this routine in your own programs, all but the most experienced programmers will be baffled by your programming prowess.

```
Ø REM IMITATION RESET 64 - MICHAEL GRIMM
                                        :REM*8Ø
1Ø FORT= 49152 TO 4932Ø                 :REM*55
2Ø READD:POKET,D:CK=CK+D:NEXT:IFCK<>14997T
   HENPRINT"ERROR IN DATA!":END         :REM*249
3Ø SYS 49152                            :REM*2Ø4
4Ø DATA 169,196,32,16Ø,192,16Ø,9,162,255,3
   2,179,238,2Ø2,2Ø8,25Ø,136,2Ø8        :REM*148
5Ø DATA 245,169,2ØØ,141,22,2Ø8,169,14,141,
   32,2Ø8,169,6,141,33,2Ø8,169          :REM*3
6Ø DATA 147,32,21Ø,255,162,Ø,189,52,192,32
   ,21Ø,255,232,224,78,2Ø8,245          :REM*17
7Ø DATA 96,13,32,32,32,32,42,42,42,42,32,6
   7,79,77,77,79,68,79,82,69,32         :REM*Ø
8Ø DATA 54,52,32,66,65,83,73,67,32,86,5Ø,3
   2,42,42,42,42,13,13,32,54,52         :REM*66
9Ø DATA 75,32,82,65,77,32,83,89,83,84,69,7
   7,32,32,51,56,57,49,49,32,66         :REM*161
1ØØ DATA 65,83,73,67,32,66,89,84,69,83,32,
    7Ø,82,69,69,13,13,13,83,84,69       :REM*5
11Ø DATA 77,32,32,51,56,57,49,49,32,66,65,
    83,73,67,32,66,89,84,69,83,32       :REM*231
12Ø DATA 7Ø,82,69,69,141,22,2Ø8,169,14,141
    ,134,2,96                           :REM*95
```

—MICHAEL GRIMM, SANDWICH, IL

$5DF HIDING FILES USING GEOS

If you're a GEOS user, you have access to a top-notch method of file security for all of your non-GEOS disks. Here's how: After activating either GEOS 64 or 128, place a non-GEOS disk into the drive and click on the drive's icon. Answer yes at the prompt to convert the non-GEOS disk to GEOS format.

All of the files on the disk will appear on the deskTop screen as Commodore files. To hide any files, just drag them to the bottom border and deposit them. When done, use the GEOS Close option to close the disk.

After resetting the computer, powering up in either 64 or 128 mode, then listing the directory, you'll notice that the files dragged to the border are no longer visible. To access them, run GEOS, place that disk in the drive, and drag those border files back into the deskTop.

—LEE MACDONALD, LANSING, MI

$5E0 IBM-PC KEYPAD ON C-128

Computerists who use MS/DOS-compatibles and C-128s often find themselves accidently typing numbers on the screen. That's because they're used to using the PC's numeric

keypad to control cursor movement.

As any C-128 user knows, pressing numbers on the keypad will print just that—numbers. To make the C-128 more user-friendly to PC users, Cursor Keypad 128 redefines the keypad's numbers as follows:

8 = Cursor up
4 = Cursor left
6 = Cursor right
2 = Cursor down
7 = Home
1 = Insert
3 = Delete

You can toggle between Cursor and Keypad mode by pressing the SHIFT-LOCK key. The 5 and 9 keys are disabled in Keypad mode.

```
Ø REM CURSOR/NUMERIC 128 KEYPAD - JOHN CAM
  PION                                :REM*64
1Ø FOR T=Ø TO 88:POKE 6912+T,PEEK(64128+T)
  :NEXT                               :REM*211
2Ø POKE 83Ø,Ø:POKE 831,27             :REM*115
3Ø S=6977:POKE S+4,157:POKE S+3,17:POKE S+
  12,29:POKE S,145:POKE S+6,148       :REM*36
4Ø POKE S+14,2Ø:POKE S+5,19:POKE S+1,Ø:POK
  E S+13,Ø                            :REM*36
```

—JOHN CAMPION, RANDALLSTOWN, MD

S5E1 SCREEN EDIT 64

Here's a short machine language routine that every C-64 owner can put to use. Screen Edit 64 lets you place text anywhere on the screen and perform some fancy moves with screen characters as well.

The syntax for Screen Edit 64 is as follows:

```
SYS EDIT, COLUMN, ROW, "{text}"
```

The syntax is self-explanatory; just enter the SYS number, row and column, then the text enclosed within quotation marks. A sample program is included at the end of the routine to show how messages can be moved at lightning speed using Screen Edit.

```
Ø REM SCREEN EDIT 64 - HENRY SHOTWELL
                                      :REM*29
1Ø SYS 58692:FOR T=7ØØ TO 726:READ D:CK=CK
  +D:POKE T,D:NEXT                    :REM*177
2Ø IF CK<>3566 THEN PRINT"ERROR IN DATA ST
  ATEMENTS...":END                    :REM*114
3Ø EDIT=7ØØ                           :REM*16Ø
4Ø PRINTCHR$(147)"SYNTAX:SYS EDIT,COL,ROW,
  "CHR$(34)"TEXT"CHR$(34)             :REM*22
5Ø DATA 32,253,174,32,158,183,138,72
                                      :REM*197
6Ø DATA 32,253,174,32,158,183,1Ø4,168
                                      :REM*24
7Ø DATA 24,32,24Ø,255,32,253,174      :REM*174
8Ø DATA 76,164,17Ø,Ø                  :REM*21
9Ø REM DEMO OF SCREEN EDIT 64         :REM*149
1ØØ SYS EDIT,1,1,CHR$(147)            :REM*25Ø
11Ø SYS EDIT,Ø,1,"TOP OF SCREEN"      :REM*228
12Ø SYS EDIT,Ø,24,"BOTTOM OF SCREEN"
                                      :REM*73
13Ø FOR I=1TO25                       :REM*72
14Ø SYS EDIT,I,12," FORWARD ":FORT=1TO1Ø:N
    EXT:NEXT                          :REM*131
15Ø FOR I=25TO1 STEP -1               :REM*227
16Ø SYS EDIT,I,12,"BACKWARDS ":FORT=1TO1Ø:
    NEXT:NEXT                         :REM*219
```

—HENRY E. SHOTWELL, BERWICK, PA

S5E2 DUAL-SCREEN 64

If you're a C-64 programmer needing a second instruction screen, Dual Screen 64 is for you. Incorporate this routine in your own programs to create a 1000-byte second screen that's independent of your primary screen.

After Dual Screen 64 is activated, you can toggle between screens by pressing the F1 key. If you want to access the second screen from within a program, use the command POKE 788,0:POKE 789,192.

```
Ø REM DUAL SCREEN 64 - GREG HAVENER
                                      :REM*146
1Ø PRINTCHR$(147)"PRESS F1 TO TOGGLE BETWE
  EN TWO SCREENS"                     :REM*222
2Ø FOR T=Ø TO 134:READ D:CK=CK+D:POKE 4915
  2+T,D:NEXT                          :REM*158
3Ø IF CK <> 15217 THENPRINT"ERROR IN DATA"
  :END                                :REM*176
4Ø POKE 788,Ø:POKE 789,192:PRINT"PRESS F1
  TO TOGGLE"                          :REM*17
5Ø DATA 173,1,197,2Ø1,1,2Ø8,12,238,2,197,7
  6,112,192,95,234,234,234,234        :REM*81
6Ø DATA 234,165,197,2Ø1,4,2Ø8,84,16Ø,Ø,185
  ,Ø,4,141,Ø,198,185,Ø,193,153        :REM*251
7Ø DATA Ø,4,173,Ø,198,153,Ø,193,185,Ø,5,14
  1,Ø,198,185,Ø,194,153,Ø,5,173       :REM*29
8Ø DATA Ø,198,153,Ø,194,185,Ø,6,141,Ø,198,
  185,Ø,195,153,Ø,6,173,Ø,198         :REM*236
9Ø DATA 153,Ø,195,185,Ø,7,141,Ø,198,185,Ø,
  196,153,Ø,7,173,Ø,198,153,Ø         :REM*27
1ØØ DATA 196,2ØØ,192,Ø,2Ø8,179,169,1,141,1
   ,197,76,49,234,173,2,197,2Ø1       :REM*43
11Ø DATA 32,2Ø8,246,169,Ø,141,1,197,169,Ø,
   141,2,197,76,19,192,Ø,169,Ø        :REM*59
12Ø DATA 141,Ø,Ø,Ø                    :REM*211
```

—GREG HAVENER, BIGFORK, MT

S5E3 C-128 VIDEO SWITCHEROO

Here's how C-128 owners can watch video on their monitors in 40-column mode, while at the same time going about computing chores in 80-columns.

First, collect your trusty old 1902 or 2002 monitor (or newer 1084); your C-128; a 2-into-1, Y-type cable with RCA-type connectors; and a VCR or camcorder. Plug the single-end RCA plug of the 2-into-1 cable into the Video Out connector on the video source and the dual ends of the cable into the Chroma and Luma inputs on the back of the monitor. (You can also run a single audio cable from the video source to the Video In on the monitor.) Plug the RGB Out connector on the computer into the RGB In of the monitor. Turn on your video source.

Now, you can watch either video or cable television (sent through your VCR) in 40-column mode, and during the commercials (or scary parts) switch back to the 80-column word processor you're using to write that letter to Magic.

—TIM WALSH, PETERBOROUGH, NH ■

News and New Products

With headliners like Dr. Evil, Elvira and The Hangman, you might think it was Halloween. But we know it's just another day in Commodoreville.

By JANICE GREAVES

New AD&D Series Just Released by SSI

SUNNYVALE, CA—It takes a lot to get Dennis to stop the presses here at *RUN*. But when I got the mail this morning, I knew it was one of those moments: SSI has just started shipping the first title in an all-new series of Gold Box AD&D fantasy role-playing games: **Gateway to the Savage Frontier.**

Gateway takes place in previously unexplored territory within TSR's Forgotten Realms game world. Starting in the town of Yarter, you trek over a vast wilderness, gathering items of mystical power so you can save the frontier from dark invaders. Characters begin at the second level and advance to the eighth.

Gateway is based on an enhanced version of the award-winning game system used in Pool of Radiance, Curse of the Azure Bonds and Secret of the Silver Blades AD&D computer games. It offers 40–100 hours of playing time.

Unfortunately, this is probably SSI's last title for the C-64. They may not even publish the C-64 Savage Frontier sequel. That would truly be a tragedy.

In the words of former Software Gallery columnist Walt Latocha, "It's not so much that SSI produces so many role-playing games or that they're so large. No, the truly amazing accomplishment of this prolific software publisher is the consistently high quality of its products."

The game is being released at $49.95; the clue book is $12.95. To order, contact Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; 800-245-4525.

Elvira Vamps the 64 Market

ROCKVILLE, MD—In the spring of '91, Accolade launched **Elvira: Mistress of the Dark** on the MS-DOS and Amiga markets. The game made a big splash, winning *Computer Gaming World*'s coveted "Role Playing Game of the Year" award for 1991. Now it dives into the most dedicated computer gaming market in the world: C-64 adventure gamers.

The story goes something like this: Elvira had a great-great grandmother named

The Halloween queen on your 64 screen: Elvira's Commodore debut.

Lady Emelda who killed her husband. Her lover died in a hunting accident, and soon thereafter she killed herself. Needless to say, the castle is simply teeming with spirits. Your task is to rid Killbragant Castle of these spooks.

The game offers a point-and-click interface instead of keyboard commands. The developer boasts that the graphics and sound of the C-64 version will rival those of its Amiga counterpart.

MicroValue, the English company responsible for the Elvira series, tells me that there are already plans for a sequel and for an arcade version.

To find out more, contact Bethesda Softworks, 15235 Shady Grove Road, Suite 100, Rockville, MD 20850.

Dr. Evil Meets CMD

EAST LONGMEADOW, MA—Big doin's at Dr. Evil and Creative Micro Designs. First, Dr. Evil Laboratories of Redmond, Washington, announced that, effective January 1, 1992, the company would "cease all operations." Former General Manager Kent Sullivan has personally taken over distribution of the PD telecommunications program Kermit v2.2, as well as the Replacement Character ROM for the BI-80 80-column card (VT-100 graphics). For information about those products, contact Kent at 16611 N.E. 26th St., Bellevue, WA 98008.

Never fear, SID Symphony fans! Creative Micro Designs will provide service and technical support for your SID Symphony Stereo Cartridges and SwiftLink-232 Serial Interfaces, even those initially purchased from Dr. Evil. (CMD began selling those products a year ago, and will continue producing and selling them.) CMD will also continue marketing an entire line of SID-related products.

Dr. Evil's support services offered on the CompuServe, GEnie and QuantumLink networks will cease at the end of 1991. CMD offers technical support on QuantumLink.

One final bit of news: Holz Computer Supply has begun exclusive Canadian distribution of CMD's entire line and welcomes inquiries from distributors and user's groups. Contact Holz at 403-262-6896. For more information about Creative Micro Designs or their products, write to 15 Benton Drive, PO Box 646, East Longmeadow, MA 01028.

Hang 'em High

PALM BEACH GARDENS, FL—Available exclusively for the C-64, **Hangman's Hazard** is an animated version of the classic word game. As captives in the three-dimensional dungeon of the black-hearted Hangman, two to four players compete fiercely to advance along the path to freedom. Progress depends on each player's ability to score points by solving word puzzles. Losers either remain in prison or visit the Hangman.

The word game is challenging, with a healthy blend of skill and luck, over 3000 puzzles, and a large timer with individually selectable time limits to equalize the competition. Hangman's Hazard can be played in groups or one-on-one. Computer opponents can play at three difficulty levels. Darkside Software is selling Hangman's Hazard for $19.95. Write to them at 5501 Miramar Lane, Palm Beach Gardens, FL 33410.

Tennis Anyone?

WESLEY CHAPEL, FL—Have you always dreamed of playing at Wimbledon or the U.S. Open? **Tie Break Tennis**

from DigiTek gives you the chance. Play singles or doubles in any of the major tournaments, including the French Open, the Australian Open, The Masters and the Davis Cup. You choose the court surface and the racket type.

Acquaint yourself with the game in Training mode, then go on to full tour-

Always wanted to play at Wimbledon? Tie Break Tennis can take you there.

nament play. The game automatically keeps track of individual tournament rankings, which can be saved and improved in later matches. In singles play, up to 16 players can participate; in doubles, up to 8. The game also offers a variety of computer opponents with differing skills and strengths.

This DigiTek simulation is being sold for $29.95. For more information, write to DigiTek, 1916 Twisting Lane, Wesley Chapel, FL 33543.

Making Music

REISTERSTOWN, MD—Triangle Audio has developed **M1 Librarian**, a voice data/sequence librarian package for the Korg M1 or M1R and C-64/128 with a Passport, Sequential or compatible MIDI interface.

The voice data librarian will send and receive single programs, combinations or entire banks in either memory mode, from either the M1's internal memory or a RAM card. Separate program/combination and sequence librarians are provided on the same disk.

In addition, with M1 you can:

- Rearrange and copy programs and combinations between banks singly or in 20-voice blocks.
- Save banks of programs and combinations separately or together.
- Convert files automatically between 100-voice and 50-voice formats.
- Send voices to the M1 and try them out immediately, without repatching cables.
- Easily move around the program via pop-up disk directories.

The M1 Librarian is now selling for $40 plus shipping. Ordering information is available from Triangle Audio, 604 Shirley Manor Road, Reisterstown, MD 21136-2319.

C-64 Spreadsheet

MONTREAL, QUEBEC—Pankhurst Programming continues its Calc spreadsheet series for the C-64 with **Calc II**, featuring enhancements such as windowing, sorting and virtual printing.

Calc II offers the speed of machine language with the ease of Basic. It includes over a dozen functions from Basic, plus special spreadsheet functions for working on tables.

Calc II allows up to 240 rows and columns with four display windows on the screen, and either row or column locking. With fast, smooth scrolling and a GOTO command, data throughout the spreadsheet can be viewed quickly. Cells can be configured with settings such as flush left and flush right, 0–14 decimal places, and variable column. Cells can be displayed in bar-graph format using 16 optional colors.

When printing a spreadsheet wider than the printing area, Calc II automatically splits the spreadsheet, printing the right-most sections on later pages.

Additional features include row and column sort (ascending or descending); full support of either disk or tape; and editing commands such as Copy, Insert Column or Row, Delete Column or Row, and Erase Cell.

The Calc II program is selling for $34 from Pankhurst Programming, PO Box 49135, Montreal, Quebec H1N 3T6; 514-727-3596.

CyberVideo

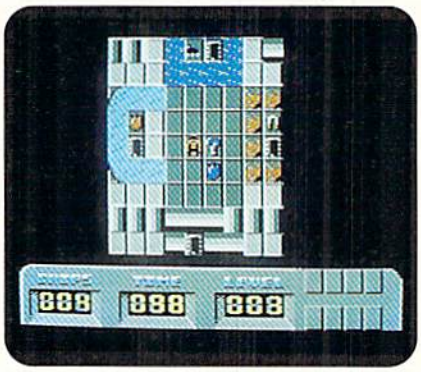
NEW YORK, NY—Since the 1982 publication of William Gibson's sci-fi novel *Neuromancer*, self-styled "cyberpunks" in the U.S. and Europe have dedicated themselves to realizing Gibson's fictional world. Cyberpunks are typically associated with computer hacking and piracy.

Cyberpunk, an "edutainment" video, tells how this phenomenon began and explores its implications. Included are interviews with Gibson, Jaron Lanier, Timothy Leary and Michael Synergy, in a futuristic mix of animation, live action and image processing.

Cyberpunk (VHS, hi-fi stereo, 60 minutes, $29.95) was directed by Marianne Tranch and produced by Peter Von Brandenburg. It's available from Mystic Fire Video. To order, call 800-727-8433.

Challenging Chips

REDWOOD CITY, CA—Epyx has come out with a new C-64 action/strategy



Chip's Challenge by Epyx, with 144 levels of play, is a puzzle-solvers delight.

game, **Chip's Challenge**, offering 144 puzzle-solving levels. Because success in Chip's Challenge requires astute logic and deft eye-hand coordination, the game has distinctive appeal.

Solving a level usually involves collecting microchips with available tools such as keys, magnets, shields and cleats. Doors, traps, monsters and other mischievous devices pose barriers, tempt you into danger, and generally complicate your progress. The first eight levels are teaching puzzles, which introduce you to the game's basic concepts.

Because Chip's Challenge has so many levels, you can begin a game on any level you wish, and you get an unlimited number of "lives." The levels are progressively more difficult.

Chip's Challenge is being released at $33.95, and is distributed by Epyx, PO Box 8020, Redwood City, CA 94063; 415-368-3200.

Commodore Gamers Are #3

WASHINGTON, DC—According to a recent study by the Software Publishers of America, Commodore computers are the third largest platform for computer gamers, following IBM and Amiga. The report showed that simulation games are the most popular, representing 36 percent of sales, followed by role-playing (26 percent) and arcade/action (22 percent) games, leaving sports and family entertainment far behind with 9 and 7 percent of the market, respectively. ■

MAIL RUN

This issue we have feedback on cartridges, will kits, productivity software and the future of Commodore. Plus: a list of peripheral-supporting software!

PRODUCT SOURCES

I own a C-64 and I'm having trouble finding software and hardware for it. Can you help?

—JASON TURNER
FOSTER CITY, CA

Well, Jason, there are a number of national retail stores that still carry C-64 products, including Walden Books, Babbage's, Electronic Boutique, Software Etc. and American Software. There are also several mail-order distributors that advertise in our pages and carry Commodore products. If you don't live near a store that carries C-64 products, the mail-order companies you see in RUN *are a good source. Don't forget to compare prices.*

There are still many companies developing high-quality hardware and software for our computers, so don't give up hope! It just takes some patience to find them.

—EDITORS

CARTRIDGE CRAZY

I would like to thank Ron Hoffman ("Put Software on Cartridge!," September/October Mail RUN). I have looked for over a year for a word processing program on a cartridge. When I called Brøderbund, the manufacturer of the word processor I use (Bank Street Writer), to see if it was available on cartridge, they replied that it wasn't and they had no plans to offer it.

I have an expansion cartridge port, as I am sure many other users do, and it would be a great convenience to be able to throw a switch and have a word processing program available on power-up. (Besides, I hate the rattling sound of the disk drive.)

I have not written before, because I assumed that I was the only person among millions that was interested in a cartridge-based word processor. If there are others like me, speak up and let the software suppliers know there is a market waiting for such a product.

—ROBERT WILSON
TIPTON, MI

A cartridge product called the Quick Brown Box (Brown Boxes, Inc., 26 Concord Road, Bedford, MA 01730; 617-275-0090) comes with a word processor named The Write Stuff resident on it. However, the Quick Brown Box is much more than a designated word processor; it's actually a RAM expansion device that has its own battery and can store programs and data even when the computer is shut off. Of course, you must pay for this flexibility; the QBB starts at $89. For more details about this product, see "The ABCs of REUs" in our November/December '91 issue.

—EDITORS

CONVERSION PROGRAM UPGRADE

Thank you for mentioning my program RLE/DOODLE.SDA in the article "Converting Graphic Files" (September/October 1991 *RUN*).

Since uploading that program to Q-Link under the name WendelUrth, I have greatly improved it. I rewrote the compatibility with JJ and RUNPaint files. Although I am no longer on Q-Link, the upgrade can be ordered for $2 from the address listed on the title screen of the original program.

—CURTIS KAYLOR
AKRON, OH

THE FUTURE OF COMMODORE

A bit more than a year ago I bought my first computer, a second-hand C-128 with a 1571 drive, an 803 printer and a 1701 monitor. (What does 80-column mode look like?). At 32 years of age, I felt the same as I did when I got my first "Hot Wheels" race set. I loved my computer then, and I still run my old graphics-and-sound program to wake me up occasionally. Yes, shining LEDs and a glowing monitor are often my nightlights.

Although an amateur programmer and relentless late-night hacker, my purpose in life has finally found me. (Or should I say I've finally found myself?) This "computer thing" is what I hope to make my living with. There is no doubt in my mind as I read the documentation of those developers fortunate enough to be published, that this field is for me.

But during the last six hours I spent debugging my first adventure game, a certain thought kept tugging at me: How many Commodore owners are there in the U.S.? Will the market fold up on me (and everyone else)?

Finding *RUN* was a gold mine to me (with all due respect to Lou Sander), and I haven't even finished reading my first issue yet. But, the magazine is quite thin compared to the other computer magazines stacked all over my office, and I notice there are no ads in there from Commodore.

So, should I expand my C-128? Or should I upgrade to an Amiga, or maybe to a... (I won't even mention it)?

—ANONYMOUS

You've raised several issues that RUN *editorials have addressed over the past few years, questions that continue to dominate the Commodore market. These few facts are the only answer we can give you: The C-64 is the best-selling home computer EVER, with total sales topping six million units. And even though our numbers have dwindled over the past few years because of competition from Apple/Mac, IBM/clones and Amiga computers, the C-64 and 128 are still profitable formats for development. And our humble magazine still has over 65,000 readers! Not bad for a "dying" market. Rest assured, the Commodore user is not on the endangered species list just yet.*

We certainly can't tell you what to do, but it makes sense to start any business in a field that you know and enjoy. Keep us posted!

—EDITORS

IN PRAISE OF PRODUCTIVITY

I would like to compliment you on the September/October issue of *RUN*. Instead of seeing the usual consolidation of game reviews and game programs, you concentrated on useful subjects, such as conversion programs, video utilities, ►

Check out page 64 for an update of the RUN user's group list.

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C-128 paint programs and GEOS software. I actively use productivity software, and I learned a great deal more about it from that issue.

The article on sharing ASCII and graphics files between different computers was outstanding. I have access to an IBM PC and an Apple Macintosh at work. I also belong to Q-Link and was unaware of many of these graphics conversion programs. Now, using the C-128 and the Mac, I have been able to exchange and laserprint GEOS and Basic 8 graphics. Sharing files with other computers will give my C-128 an unlimited lifespan.

I hope you plan on printing more productivity and conversion articles in the future and waste less space on games.

—William Lecomte
Burlington, MA

I was recently asked to give a talk on how to construct a newsletter using geoPublish. On the day of my presentation, someone showed me a copy of your August 1991 issue with the headline "Publishing With GEOS." I had no idea that you were coming out with an edition that was almost entirely devoted to geoPublish.

After my presentation I had a chance to read the issue, and I must say I really enjoyed all three articles about using geoPublish.

I commend all three authors, Gerry Descoteaux, Robert Austin and Larry McCoy. Each provided a different angle and insight on what you need to do to produce a newsletter. As the founder and editor of a semi-annual newsletter called MAZAHL (Sidereal Astrology and your Macrobiotic Health), I can appreciate the time, effort and skill necessary to put together a newsletter, brochure or advertisement using a program like geoPublish.

More issues devoted to the capabilities of GEOS would be welcome.

—Shemu-ail ben-Moshe
Philadelphia, PA

Do-It-Yourself Will Kits

I want to offer some help to Sharon Jayska (September/October Mail RUN). I have a shareware program called Simple Will Kit that is a fill-in-the-blank sequential file. I've used it myself, and will make it available through The Mailbag BBS (205-835-3807; 1200 baud).

—Norman Morrison
Oxford, AL

Thanks, Norman! We also had a number of letters about a program called WillMaker, by Nolo Press. Unfortunately, a call to Nolo Press revealed that the program is no longer being published. Copies might still be available through software distributors.

—Editors

1541/1571 Drive Alignment

In the ProTips section of the September/October *RUN*, there was a paragraph on 1541/1571 drive-alignment problems. It did not, however, give the exact name of the program or say where to purchase it. I would appreciate any information you can give me about this program.

—Andre Berube
Providence, RI

Believe it or not, the name of the program you're interested in is "1541/1571 Drive Alignment." It's from Free Spirit Software and is available through many distributors of Commodore products, including Software Support International and The Grapevine Group (check our ads).

—Editors

I Paint Author Picks Nits

I want to commend you and John Ryan for the review of 128 Paint programs ("Paint Versus Paint," September/October '91). It concisely covered the main concerns of those buying a graphics package. However, as the author of I Paint, please humor me while I nitpick on a couple of points.

First, I Paint offers virtually unlimited fonts, not seven as reported. There are eight font slots: seven permanent, one disk-loaded. Thus, you are limited only by the number of fonts on disk(s). In addition, I Paint comes with a condensed file that automatically expands into 11 more font files and several printer drivers; and more are available through such sources as Q-Link. I believe Masterpaint is similarly unlimited.

Second, on large REUs, I Paint allows both a RAMdisk and full-screen clip and safe areas, not just an either/or choice. This is a luxurious combination, offering something of Mr. Ryan's spare-screen merge wish.

—Rick Kane
Minneapolis, MN

That's not such a nit-pick! Thank-you, Rick, for clearing up the misunderstanding. While we're on the subject, we have some information about I Paint's publisher, Voyager Mindtools.

It seems that the company is no longer in business. SSI is currently distributing I Paint (800-356-1179), and Dialogue 128 is being distributed by Triple Point Software (Box 369, 253 Collete St., Toronto, ONT, Canada, M5T 1R5). Unfortunately, we do not have information regarding Voyager Mindtools' other products.

—Editors ■

Got something to say? Here's your place to say it. We always enjoy hearing from our readers (even if they're mad at us!). Send your letters to Mail RUN, c/o RUN *Magazine, 80 Elm St., Peterborough, NH 03458.*

Peripheral Vision

We have had several requests for a list of software that supports the 1351 mouse, the 1581 disk drive and the 17xx series of REUs. Here is a list of our favorite software that supports these peripherals. If you have a favorite program that you would like to add to the list, please write to Mail RUN, RUN *Magazine, 80 Elm St., Peterborough, NH 03458. Periodically we will publish an updated list.*

—Editors

Product	Mouse	1581	REU
1581 Toolkit		•	
Adv. OCP Art Studio	•		
Basic 8	•		•
BB Writer v2.0			•
Bible Search		•	
Big Blue Reader		•	
Cadpak			•
Dialogue 128			•
Fleet System 4			•
Fontmaster 128		•	•
GEOS v2.0*	•	•	•
I Paint	•	•	•
JiffyDOS		•	•
Maidstone Quest	•		
Master Paint	•		•
Maverick v5		•	•
News Maker 128	•		•
PaperClip III			•
Pocket 2 Series	•		•
PocketWriter 2/3			•
Sketchpad 128	•		
Spectrum 128	•		•
Super 81 Utilities		•	
Super Snapshot 5		•	•
Superbase 3.0		•	
Tax Command			•
The Write Stuff		•	•
Ultraterm III		•	
VizaWrite v1.5 & up			•
Word Writer		•	

* *Includes deskTop, gateWay and related GEOS applications.*

SOFTWARE GALLERY

Dirt, dribbles, death and dough: Reviews of Super Off-Road, Dream Team, Iron Lord, SEC Check Register and Golden Axe.

By JOHN RYAN

IRON LORD .....B+

An arcade-fantasy-strategy-role-playing game from Europe.

With American software production for the C-64 in a tailspin, it's reassuring that the Europeans are beginning to pick up the slack. If Iron Lord is indicative of what we can expect from our European cousins, then reports of the demise of the C-64 software market may very well be premature. Iron Lord is a medieval fantasy game that sports a little bit of everything. It is not a fantasy role-playing game, yet there are elements of FRP throughout. It is not an arcade game, nor is it wholly a strategy game, though certainly there are arcade sequences, and strategy comes into play as well. Iron Lord effectively combines all these genres into one package.

As the forgotten son of a dethroned king, you have returned home after five years of fighting the Holy Wars. While you were away, your uncle seized power and the land fell, abject. Your task: to take the kingdom back from the thieves, assassins and spies who now rule.

But it will not be easy. The people's mistrust is so deep that even you, the rightful prince, must prove your mettle to the kingdom's jaded subjects. In order to fight and win the war against the Army of Chaos (thereby restoring your throne) you must persuade the inhabitants to follow you into battle.

Much of the action takes place on a high-resolution map of the countryside, showing an overhead view of several towns, castles and interesting areas that you can visit. You need only direct your knight to a particular area and he'll quickly gallop on horseback to that destination. Once in a town, the view switches to show the local area, again with an overhead view. As you guide your knight around a town, you'll find places to visit such as inns, pubs and herb shops.

Since your first job is to convince the people that you're a prince with whom to reckon (true royalty always uses proper grammar), you'll probably want to spend much of your time initially at the archery range and the gambling house. At the archery range, you'll vie for respect with displays of marksmanship. Even though the archery competition is one of the more entertaining aspects of the game, you'll find that becoming proficient enough to qualify through the three rounds of competition will take a lot of practice. At the gambling house, arm wrestling and dice games will further your reputation as well—if you're good enough.

European imports like Iron Lord bode well for the future of C-64 gaming.

From time to time you'll find yourself confronted by enemy knights. During battle, the view changes to the first person: The enemy appears directly ahead of you. Fights are usually short and have little influence with the locals. Of course, getting hacked up is not conducive to good health.

At some point during the game you'll finally convince the populace to arm themselves and follow you into battle. This "final" battle occurs over a series of turns comprised of troop movement then battle, which occurs on an overhead map showing both armies. If your army is successful in battle, you'll move on to the final phase of the game: The Labyrinth. You must maneuver (and fight) your way through all six levels to win the game.

There's a lot to Iron Lord, and many players may find one aspect more fun than the others. The graphics are particularly good, as is the sound, with high-resolution screens and a superb musical soundtrack. The game comes on a double-sided disk and the loading time between scenes is tolerable.

Whether you like arcade, strategy or FRP games, I think you'll enjoy Iron Lord. It deftly combines them all into a single story. To the programmer's credit, Iron Lord is one of the few all-in-one games that actually delivers.

(UBI Soft/Electronic Arts, PO Box 7578, San Mateo, CA 94404; 800-245-4525. C-64/$29.95)

SOFTWARE REPORT CARD

Outstanding	A
Good	B
Average	C
Below Average	D
Crummy	F

GOLDEN AXE .....A

Solid gold arcade excitement for iron-clad gamers.

Ready for some unabashed, slashing, cymbal-crashing arcade action? Tired of FRPs, RPGs and colorless CRTs? Are you the type who's gone through five tempered-steel joysticks in the past three months? If so, Sega's great coin-op Golden Axe has been translated to the C-64 just for you. An amazing thing about this translation: It looks and plays great—no small feat in this age of mass antiseptic translations.

The Death Adder and his minions have invaded the land, imprisoned the king and his daughter, and pilfered the legendary Golden Axe. You must defeat the Adder and regain the throne. In the great tradition of arcade-game reality, being a hero means nothing less than hacking your way to victory.

The vivid graphics and stirring soundtrack of the opening sequence really set the mood. Golden Axe offers you the ►

chance to play one of three heroes, each with different strengths and weaknesses. From there, you are off to save the land. The game offers full-screen scrolling graphics as your character moves from left to right. During your travels, monsters will advance from either side of the screen and attack. With your fingers firmly clenched to your joystick, you can jump, kick, leap, head-butt or otherwise slash your way through each screen.

Successful strikes against a monster slowly sap its strength until it dies. Successful strikes against you will do the same. If you manage to beat off each series of attacks, you advance to the next screen and, eventually, the next board. Occasionally, small thieves scurry to and fro across the screen. Kicking them will dislodge little goodies that you should pick up. These urchins often carry magic potions or food packets that can increase your strength or stamina.

The boards grow successively more difficult. The monsters get bigger and stronger, more difficult to beat. You'll have to depend on your prowess with the joystick and, admittedly, sheer good luck. Along the way you'll find strange, fire-breathing mounts to aid you. Of course, saving your magic potions for just the right enemy is paramount. You have several lives to work with and, if you die, the game will allow you to continue where you left off. Hey, no one said that being a hero would be easy—and in Golden Axe, it's not.

Hey, no one said being a hero would be easy—and in Golden Axe, it's not.

It's hard to find anything to gripe about with this game. There are no pretenses here, no grand claims or promises. It's arcade action that plays smoothly and quickly. Graphics and animation? Superb. Here (at last!) is a game that offers mindless entertainment without apology.

(Sega/Electronic Arts, PO Box 7578, San Mateo, CA 94404; 800-245-4525. C-64/ $24.95)

SEC Check Register 128.....B+

Extras such as check printing set this bookkeeping package apart.

When I bought my first computer in 1979, I had to come up with some darn good excuses to quell my wife's alarm at the cost of the machine. Recipe-filing and checkbook balancing to the rescue! Looking back, I can see how ludicrous these justifications must have seemed—even with a $2000 computer it was much quicker to balance a checkbook by hand.

This stands as true today as it did back then, so I was surprised to see another check-managing program on the market. It's release is somewhat justified, however, because Check Register 128 does more than just balance your checkbook. It offers a complete checking account manager, but also sports features that print checks and track loans and investments.

The program requires a C-128 (with upgrade ROMs) or a 128D. It operates in 80-Column mode only and supports the 1500 family of disk drives.

Obviously, the bulk of Register 128 is designed to aid you in managing your personal or small-business checking accounts. Although it's not revolutionary by any means, the software contains several interesting features for those of you who have an active checking account.

The register can hold up to 750 entries. Once that limit is reached, it can be saved to a history file on your work disk.

In addition, the program supports check printing and envelope addressing, and you can configure Register 128 to fit various check styles and formats. Setting up the printer variables for doing so, however, takes a bit of trial and error. You'll need to save a definition file for each check format, which involves

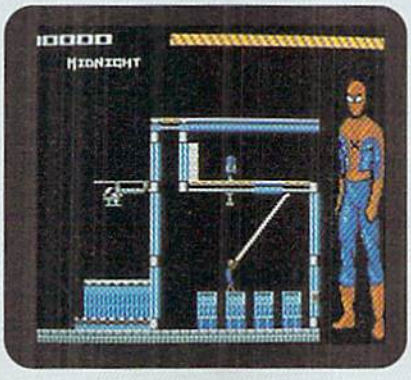
The Amazing Spider-Man .....B–

The arachnid hero's a marvel, but he's less than super

Twice before, Paragon Software successfully brought Marvel comic books to the C-64 with Dr. Doom's Revenge and The X-Men. However, The Amazing Spider-Man, Marvel's latest, doesn't quite live up to its predecessors.

This six-level game begins when Spider-Man's wife is kidnapped by Mysterio, a longtime Spidey foe skilled in chemistry, hypnotism and magic. Mysterio has ordered the famed wall-crawler to the old abandoned Rockwell Movie Studios, where he must run an evil gauntlet to rescue his mate.

With a joystick or keyboard, you'll have to guide the brave webslinger past Mysterio's booby-traps. He'll face spikes, electrified ceilings, gas, illusory floors, and robots that can look like Mysterio,



Spider-Man isn't up to its Marvelous predecessors, but it's solid fun anyway.

Mary Jane—even Spider-Man himself. Your main hope for survival lies with Spider-Man's super powers, including his incredible strength and his ability to climb walls. Also important, of course, is his web, which can free him from tight situations.

A key feature of this program is finding and activating switches that change the structure of the room you're currently seeing, and off-screen areas as well. These tricky devices provide a stimulating tactical challenge.

The graphics, animation and control system are good, but there are problems with other elements of the software. The sound leaves much to be desired, with long periods of total silence. The copy protection is excessive (you have to answer three questions), and there's no Save option, a much-appreciated feature of the previous two Paragon programs.

Even though it could be better, The Amazing Spider-Man will appeal to many players. Its mental challenge and world-famous title character should attract a large, enthusiastic audience.

(Paragon Software; distributed by Microprose, 180 Lakefront Drive, Hunt Valley, MD 21030. C-64/$29.95) ■

—Walt Latocha

telling the printer how many columns and lines to advance for each entry and what printer codes, if any, need to be sent to your particular printer or interface. I suggest that you practice the setup using plain printer paper first. Checks (particularly the form-feed variety) are too expensive to waste.

You can set up recurring payee files and addresses. Recurring entries (those items you must pay regularly, including mortgages, payroll, cable TV, etc.) are tracked by reference numbers and handled a bit differently within the register. You can establish as many as 54 payee records with their addresses, and print out the checks and envelopes for the payee. Debits are handled automatically here as well.

Outside the checking program, a financial calculator is available to help you determine the future value of investments and deposits. It will also calculate loan information, including amortization (a record showing how fast you will pay down the principle of your loan).

Register 128 is a solid package and relatively fast. The 12-page, staple-bound documentation is basic, but it is complete enough to help you through some of the more difficult areas of the program. A utility is included to help users of previous versions of this program convert their files to the new format (v1.03).

If you've been looking for a checking manager, then Check Register 128 may be just the program for you. If you're already using a good checkbook program, either public domain or commercial, then SEC Check Register probably won't give you anything new.

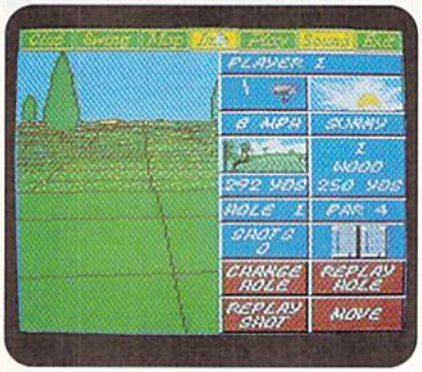
(Sparks Electronics Co., PO Box 4475, St. Joseph, MO 64504. C-128)

GREG NORMAN'S SHARK ATTACK! THE ULTIMATE GOLF SIMULATOR.....C

Golf simulation fans will be teed off by this disappointing game.

If you don't know who Greg Norman is then you'll probably think this game occurs in an ocean somewhere. "Shark Attack" actually refers to the Australian golfer's nickname: The Great White Shark. Be that as it may, this simulation is disappointing in many ways—so many, in fact, that I had the irresistible urge to look up the word "ultimate" in the dictionary to make sure they hadn't redefined the word recently.

It was a harbinger of the disappointments to come when the game would not boot on my 128D in C-64 mode. I removed all of my peripherals, knowing that sometimes games won't load with these extras attached, but to no avail. I even tried booting the game on a friend's 128D; still no luck. Finally, I dug out my old "flat" C-128 and, yes, it booted fine. I also tested the game on a C-64, again without problem. (One editor back at *RUN* HQ claims that it booted fine there on a 128D in 64 mode. I think she's just bragging.)



Shark Attack offers a plethora of variables, such as wind speed and ball effects.

Being an avid duffer, I went into this game wondering how it would measure up to earlier golf simulations, such as Leaderboard and Jack Nicklaus's Greatest 18 Holes of Golf. Sadly, Shark Attack falls woefully short of both in both graphics and playability. The simulation is not terrible; it's just not as good as other products currently available, especially if their "ultimate" claim is taken seriously.

Once you get past a rather long loading period and password check, you're presented with a main screen and a plethora of choices: You can set up wind and weather factors, ball effects such as back and side spin, and have a caddy help out with club selection and course play. Shark Attack has several unique features that help make it realistic. You can, for example, design your own swing by altering your swing arc. You can even open and close your club face and adjust the loft.

Although Shark Attack incorporates many features standard in golf simulations (plus a few unique ones), it nonetheless suffers in graphics and realism. The murky, ill-defined graphics look as if they were converted from IBM CGA-type colors, giving everything a yellowish-green cast. The landscapes are rather fractal and don't impart much realism to the simulation. Without using the overhead map, it is difficult, at times, to judge your position relative to the pin.

More important, though, game play itself seems disjointed. The swing is not very smooth and the ball moves impossibly fast once it's hit. A 250-yard drive takes about as long as a 50-yard wedge shot. I didn't get the sensation that my ball was soaring up into the heavens and then falling to the fairway with a gentle bounce. The bullet-fast flight really detracts from the simulation.

On the other hand, screen updates are relatively fast as you play through a hole, since disk access occurs only when you move from hole to hole. Shark Attack includes two full courses and a roster of ten predefined computer players, each with their own experience, stance, grip, swing and fitness factors. Plus, the roster can hold up to 40 additional user-defined players. The documentation is straightforward and includes tips from Mr. Norman, along with strategies and handicapping formulas.

If I sound disappointed with Shark Attack, I am. This simulation does little, if anything, to build upon advances made by other golf simulations. In fact, in at least the graphics and realism categories, it falls short of earlier efforts.

(Virgin Mastertronics, 18001 Cowan, Irvine, CA 92714. C-64/$19.99)

SUPER OFF-ROAD.....B

It's like a demolition derby and a slot car race, all rolled into one.

This cute coin-op translation gives you a taste of what it must be like to drive an off-road race truck.

This is demolition derby on dirt. No sleek formula racers here, only jacked-up race trucks with reinforced cabs, roll bars and super-strong suspension systems. Likewise, the drivers have little regard for safety as they push their vehicles to the limit over hills, gullies, water holes and hordes of other treacherous obstacles.

In Super Off-Road, you always face three competitors. You can either play against friends or pit yourself against the computer. You participate in a series of "stadium" races, complete with hazards. There are a total of 16 track configurations available, though you'll not see all the configurations unless you can take the checkered flag in virtually all of the races.

The stadium takes up the full screen and is viewed from an oblique overhead angle. Each competitor has a different- ►

colored truck to guide around the twisting, curving track—over water holes, through mud bogs and over inclined jumps. Needless to say, the other three trucks on the track become as hazardous as the obstacles. More often than not, you'll find yourself in the midst of a demolition derby.

Each race is four laps long. The name of the game here is prize money. You'll be awarded cash according to your finish in the race. Likewise, you'll have the opportunity to pick up stray bags of money and other goodies that pop onto the track from time to time.

At the end of each race, you can stop by the Speed Shop and put your prize money to good use, purchasing nitro units, tires, shocks, accelerators and other speed-enhancing accessories. You start the game with three trucks, and lose one for each race in which you don't place first. Obviously, you'll have to win the majority of the races to see all the races to the end.

Overall, the graphics and sound are very good. The three-dimensional aspect of the stadium track, framed by the white and red barrier fences, is nicely done, and the trucks, while rather small, move precisely according to your joystick movement. Even though the game doesn't have much staying power when you play by yourself, if you can dig up a couple of friends, Super Off-Road has all the makings of slot car racing without the slots.

(Virgin Mastertronics, 18001 Cowan, Irvine, CA 92714. C-64/$19.99)

No sleek formula racers here, only jacked-up super-trucks with turbo suspension!

THE DREAM TEAM, 3 ON 3 CHALLENGE.....C

This mediocre basketball simulation made our reviewer cry foul.

Ever since the release of Jordan vs. Bird a few years ago, software publishers have been hocking sports simulations that rely on the name recognition of sports superstars. Although this one is a bit more subtle than some of its predecessors (and successors, I dare say), it is still "yet another pro-endorsed basketball simulation."

A quick glance at the package will tell you that the dream team is Patrick Ewing, Dominique Wilkins and Joe Dumars. Apparently, the creators of The Dream Team 3 on 3 Challenge see this guard-forward-center combination as the best three-man team in the NBA, and I'll not dispute that.

The Dream Team permits one or two human players to face off in a game of one-on-one, two-on-two or three-on-three half-court basketball. The game can be played on an outside court, gym- ►

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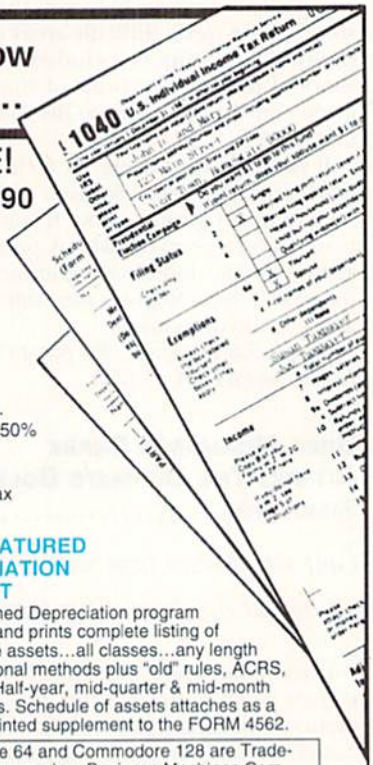

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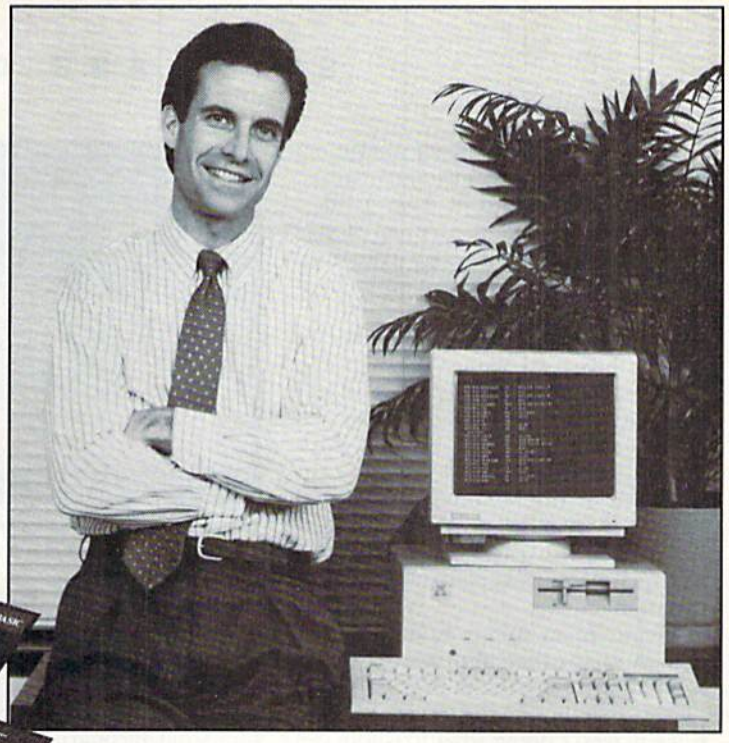

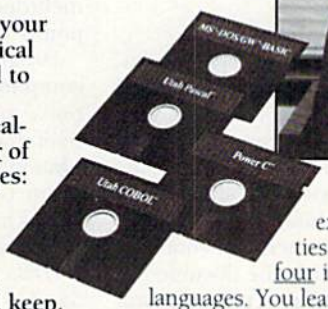

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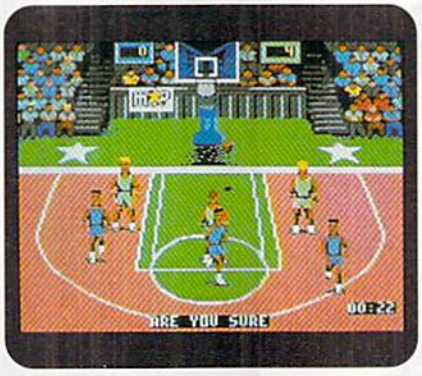
nasium court or professional auditorium court. Two sets of rules can be invoked: standard game rules or 3-on-3 rules. There is a field of 26 predefined players from which you can select your own dream team, but you can't edit the players' strengths or skills.

The half-court playing field takes up most of the screen, rendered in high-resolution graphics. Dribbling is basically automatic whenever an active player is near the ball. Likewise, shooting, passing, blocking and rebounding occur when the joystick button is pressed, and the action depends on the position of your player. Other features include variable quarter lengths, play-calling and violation handling.

Dream Team suffers from the same malady that other multiplayer sports simulations experience: With so many players together on the screen, keeping track of who's doing what to whom can get confusing. Three-on-three games place six players on the court and, even though the graphics are fairly well defined, the players tend to bunch up, making it difficult to tell which opposing player has the ball.



Half-court graphics look good, but play is confusing in Dream Team 3 on 3.

The graphics, while not spectacular, lend themselves well to the half-court simulation. I did find, however, that moving the large on-screen players was somewhat incongruous and unrealistic, especially while shooting. You'll have to rely on the score board and "swish" sound to determine whether a shot is in the hoop. Even though the documentation refers to four different plays that can be called before inbounding a ball, it doesn't go further to explain what each play does.

My real gripe with this program is the misleading packaging. The C-64 game box sports gorgeous IBM VGA graphics, which the C-64 cannot equal. But more than that, the box copy goes on to list features such as 15 play sets, handicapping, tournament play and player-roster editors. But these features *do not exist* in the C-64 version!

I realize that cutting costs often involves using one box for all versions, but if a game lists features on the package, then those features should darn well be included! (They are, after all, selling points for the game, are they not?)

Dream Team is unimpressive when compared to other basketball simulations, and having three superstars lend their names to the game seems somewhat perfunctory. On the whole, Dream Team is like a bowl of noodle soup: It makes a decent meal, but I wouldn't call it dining.

(Data East, 1850 Little Orchard Street, San Jose, CA 95125. C-64/$39.95) ■

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Hardware

RAMpage!

Are you tired of having the sand on the beach of computer respectability kicked in your face? Have you had it up to here with those uppities that relegate Commodores to the ninety-pound weaklings of the PC set? Friend, maybe *you* need to go on a hardware RAMpage!

Yes, your humble 64/128 can become a computing force to be reckoned with. Because, while most companies in this market have thrown in the towel, Creative Micro Designs has held fast to the vision that Commodore owners should be able to walk down micro-muscle beach with their chins up. And with RAMLink and RAMDrive, CMD has put their money where their mouth is.

From a Squeak to a Roar

RAM expansion on the C-64 has always been hindered by a limitation of the computer's "brain," the 6510 microprocessor. Its address bus—the part of the microprocessor that identifies which memory location the chip would like to use—is only 16 bits wide, meaning that it can see only 65,536 bytes at a time. In short, the C-64 already has all the memory it can use. The same is true even for the C-128, which is actually limited to 64K (although it finagles a second 64K by juggling different portions of memory around).

The only alternative left to hardware developers has been cheating. RAM expanders such as Commodore's 1700 series don't actually boost the computer's 64 kilobytes, but act more like high-speed disk drives. Programs use the REUs to hoard code or data in a convenient cache until needed; then they load it into the "real" RAM for use. This may sound sluggish, but it's really very fast—so fast that, as far as the user is concerned, the expanded Commodore does have more than 64K.

While these REUs may work like disk drives, they certainly aren't as easy to use from the program's perspective. Programmers must write special routines to "stash" and "fetch" data to and from the REU. Not surprisingly, few developers have been willing to spend time supporting the minority of REU-equipped Commodores out there.

As a result, REU users have had few software choices, only GEOS (which adds REU support to all of its programs through operating system routines) and a handful of 64/128-mode applications. That is, *until now*.

With the introduction of the RAMLink and RAMDrive REUs, the "software issue" is no longer an issue. Like Commodore's REUs, these products are essentially extra-fast disk drives (there's no clearing that initial 64K hurdle), but, unlike the Commodore REUs, they're accessed *as any other drive*. They hold files that can be loaded, saved, scratched and renamed with the same DOS commands the 1541 and 1571 use.

In theory, any program that can use a disk drive can use RAMLink and RAMDrive instead. Even software written for a specific drive can function with these REUs, using 1541, 1571 or 1581 emulation modes.

Plus, there's another twist: The contents of these RAM devices doesn't disappear when the computer is shut off. Power failures won't dent their armor, and you can install your main software library in RAM for near-instant use. RAMDrive is battery-backed and can keep its memory for up to several days. A similar option for RAMLink is available with the purchase of a backup battery.

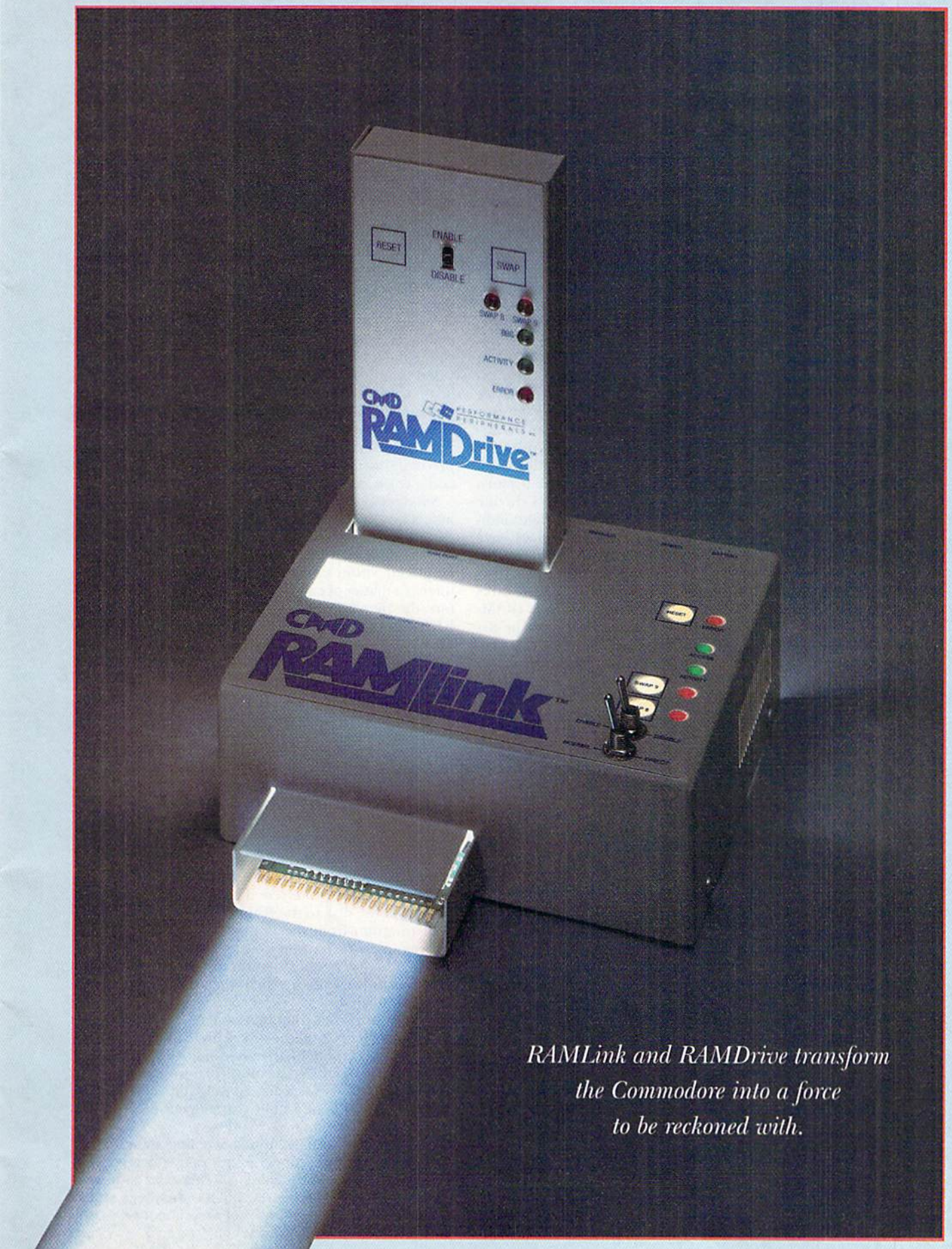
Both RAMLink and RAMDrive come with a portion of JiffyDOS—CMD's enhanced disk operating system for the C-64/128—that includes a wedge and several new commands. (This won't speed up drive access as much as the complete JiffyDOS does, however; that requires JiffyDOS drive ROMs, available separately.)

RAMDrive

RAMDrive bears CMD's label along with that of its developer, Performance Peripherals. It comes in capacities of 512K, 1 megabyte and 2 megabytes. The whole ►

By STÉPHANE DIRSCHAUER

PHOTOGRAPHED BY ED JUDICE



RAMLink and RAMDrive transform the Commodore into a force to be reckoned with.

RAMDrive is *fast* and looks like a regular disk drive to your programs.

unit is slightly larger than a deluxe TV remote control, and fits snugly into the C-64/ 128's expansion/cartridge port. The control panel has 1541-like activity and error indicator lights, plus several unfamiliar features: a reset switch and a light that indicates when the device is properly set up.

The handy Swap button lets you temporarily change RAMDrive's device number. Pushing Swap the first time assigns RAMDrive to device 8 and reassigns the former device 8 to RAMDrive's old number. A second press does the same with device 9, and a third resets all device numbers. Two lights indicate which devices have been swapped. This feature comes into play when a program talks only to device 8. (RAMDrive itself can be assigned a default number between 8 and 29 with a program that comes on the accompanying utilities disk.)

RAMLink

RAMLink is CMD's solution for those who already have an older REU. It features two slots: the RAM port, which accommodates an REU (including RAMDrive), and a pass-through port, which accepts anything that you've had in your expansion port before, such as a utility cartridge.

RAMLink's control panel sports all the features of RAMDrive's, plus a Normal/Direct switch. Flicking it to Direct lets software use the plugged-in unit as a "vanilla" REU without RAMLink's DOS.

Inside the case is a connector for a RAMCard, a CMD board that adds extra RAM to the REUs—as much as 16 megabytes' worth. A RAMCard holds up to four SIMM memory modules of either 1 megabyte or 4 megabytes each. If your RAMCard comes with less than four SIMMs, you can add more later if needed. The memory in the RAMCard and the REU can work together, or you can have a RAMCard-installed RAMLink with no REU.

Installation

RAMDrive and RAMLink (I'll refer to them collectively as the RAM drives) slide into the expansion/cartridge port, and often that's all the installation needed. However, some C-64s require a bit more. To correct a timing conflict between those computers and the REU, RAM drive owners must hook up a jumper clip inside the 64.

What's that? You'd sooner operate on your dog than your C-64? Don't worry. The only tool needed is a screwdriver, and the whole procedure takes minutes. The instructions accompanying the RAM drives are precise and include clear illustrations.

Up and Running

Once the RAM drives are hooked up, the C-64/128 displays a slightly altered power-up message indicating that JiffyDOS is active. When that appears, you'll want to set up the device's RAM.

The RAM drives organize data into partitions and subdirectories, which are as necessary as they are convenient. A 4-megabyte RAMLink, after all, can hold 16,000 files. (Apart from available memory, there's no limit to the total number of filenames.)

Because partitions must be given a fixed length and emulation type when created, they're most useful for dividing the RAM into large chunks that can be further divided using subdirectories. Native-mode partitions can be of any size, but the emulation modes are limited to the mimicked drive's real disk space. A 1541-mode partition, for example, can contain only 664 blocks. Partitions are selected with a new disk command, CP, or by preceding a filename with the partition number (1–32) and a colon, as in 3:RUNPAINT.

Subdirectories are a more flexible way to organize data in a Native-mode partition. They're created and modified with a set of new DOS commands, and they appear in the directory listing as DIR files. Subdirectories can be placed within subdirectories, *ad infinitum*. Selecting them is a matter of entering the subdirectory name(s) before the filename (e.g., APPLICATIONS/GRAPHICS/RUNPAINT).

Using Software

In the best of all worlds, every peripheral would function with every program. In reality this doesn't happen, but RAMLink and RAMDrive come as close to being completely compatible as any peripheral of their type. Thanks to the emulation modes, programs can be fooled into thinking they're dealing with a real disk drive, and a specific model, too.

The main exception, of course, is copy-protected software. Unless you can remove any disk-based copy protection, you will be unable to copy such software to the RAM drives. Several solutions, however, are available:

- In some cases, only one essential file, usually a boot program, is copy-protected. Thus, it's possible to copy the rest of the disk to the RAM drives and load just the boot program from the floppy. The Swap switch can then be used to transfer control to the REU. For instance, you may be able to put your role-playing game's data files in RAM, then switch when the main program has been loaded.
- In other situations you can use a copy program to peel the copy protection off the disk. This, naturally, requires a copier and a special parameter file that tells the program how to circumvent the particular protection. Alternatively, if a program loads entirely into memory, the "snapshot" option of a utility cartridge can be used to save an unprotected file to RAM.
- Another alternative is simply avoiding software with disk-based copy protection. Less restrictive forms of copy protection exist, such as asking you to enter a code word from the manual or a figure from a code wheel, and so on. And, an increasing number of programs, usually utilities, are not copy-protected at all.

Besides copy-protected software, you may experience difficulties using certain very task-specific, disk-intensive software, such as copy programs. My utility cartridge's copier, for example, would not work with the RAM drives. But since the RAM drives' utility disk includes two good copy programs, this is probably a moot point.

GEOS AND CP/M

All that extra RAM cries out for a more ambitious operating system than the C-64's native kernal. GEOS fills the bill, but it's also an example of those disk-intensive programs I just mentioned, so it needs a few patches to use RAMLink and RAMDrive. CMD's alternative deskTop operating environment, gateWay, includes those patches in addition to all the regular deskTop features. (See Malcolm O'Brien's review of gateWay in *RUN*'s September/October issue, on page 31.)

GateWay not only accesses the RAM devices, but actively supports them with options that use directories and partitions. C-64 and C-128 versions of gateWay are available for $3 to RAMLink and RAMDrive owners. (If you want both versions, it's $32.95.)

GEOS with an REU is fast and powerful, and the same applies to GEOS and the RAM drives. A mid-sized RAM drive is more than enough to house the system files, plus applications and data. You can even have GEOS come up as soon as you switch on your computer: A program packaged with the RAM drives lets you set a file to automatically load. Choosing GEOS as that file makes the gateWay notePad appear on your screen a few seconds after the C-64/128 activates.

GEOS applications that have special REU support built in, such as the geoDebugger part of Berkeley Softworks' geoProgrammer package, are also supported.

CP/M, unfortunately, is another story. The only way to use it with the RAM drives is to create a 1541 partition, because CP/M accesses most drives using Burst-mode commands that the RAM devices, being connected to the expansion port, just can't handle. Perhaps the introduction of a new device driver will improve the situation.

OTHER CONSIDERATIONS

Just how fast are RAMLink and RAMDrive? To get an idea, consider that it takes the C-64 little more time to access their RAM than its own, and the RAM devices run rings around any real disk drives. Access times are typically less than a second, regardless of file size. For example, while it takes a 1541 about two minutes to load a 190-block file, a RAM drive can load it in a second. Similarly, saving a 96-block program takes 66 seconds with the 1541, but less than a second with the RAM drive.

As for how much RAM you need, the general rule is: *as much as possible*. The 512K that sounds so large now may seem limiting in a few months. As you know, the hunger for more memory can be insatiable.

RAMLink and RAMDrive come with a superior three-ring-binder manual that offers everything from tips on using copy-protected software to technically detailed appendices showing memory maps and file formats. If a problem develops, telephone support is available. What's more, modem users can access CMD's product-support area on Q-Link, or on CMD's 24-hour BBS.

WHICH TO CHOOSE?

The question you should ask is not "Should I buy a RAMLink or RAMDrive?," but "Which configuration should I get?" A product that's been so carefully and successfully crafted is a rare find. It has the potential to be your most-used peripheral.

RAMLink has ports for an REU and other cartridges, as well as space inside for a configurable RAMCard memory-expansion board.

Here are a few configuration possibilities:

- Add a RAMDrive to a single 1541 for holding both program and data files. It will reduce disk-flipping to a minimum, as well as take most of the workload off the 1541.
- Install a RAMLink between your computer and REU. The REU will become much more than a device for use with GEOS.
- Install a RAMCard to increase RAMLink's memory.

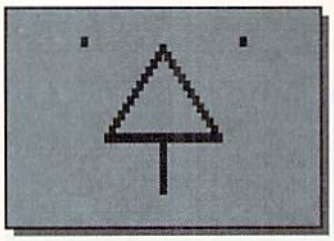
Virtually any system will benefit from RAMDrive, RAMLink or both. RAMLink is more easily expandable, and therefore makes a better long-term choice, but it's the more expensive of the two. RAMDrive is probably the least expensive way available to make all your computing smoother, easier and more powerful.

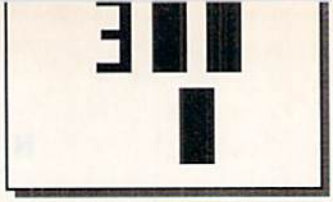
So, the next time some computing beach-bully with a fan club of one brushes you off as just another Toys-R-Us wimp, remember: You don't have to take it any more. Now you have all you need to kick up sand with the best of them. ■

Stéphane Dirschauer lives in Toronto and has been writing articles for RUN *for over a year. He loves his Commodore, and refuses to take any guff about it.*

Product Information

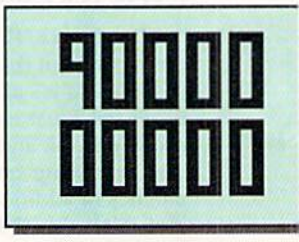
Creative Micro Designs
15 Benton Drive
PO Box 646
East Longmeadow, MA 01028
RAMDrive, $199.95*
RAMLink, $179.95*
gateWay (to owners of RAMDrive or RAMLink), $3
**Prices do not include a RAMCard with memory modules. (SIMMs are available in 1MB or 4MB capacities.)*





Mah Jongg

Call for take-out! This ancient Chinese game of skill promises late hours of addictive fun.



By JOHN RYAN

I clench my eyes to ease the stinging dryness. After a moment's pause I turn back to my 64, mind racing. With a burning stare I review the board: There was another nine *somewhere.* Did I take it already? There! It's blocked by a three—where's the other three? Got it! Back to the nines and I've opened up the whole row. I know the matches, remember where they are—move quickly for max points—clear the board—record score!

Ancient Saying: "Maybe win, . . ."

Mah Jongg's a simple game really. At least the concept is fairly basic: You just remove 132 tiles from the playing field in matched pairs. The tiles are stacked in four layers, like a pyramid. From the bottom, the layers are dark gray, lighter gray, white and green. Using a joystick you move the cursor over the tile you want and press the fire-button. Pick one tile, then pick its match; they will automatically be removed from the board. If it is not a legal match, an error message will appear.

You can pick a tile from any level, as long as its right or left edge is free. For instance, if there's a green tile between two other green tiles, you can't take it, because it doesn't have a side free. (The top and bottom edges don't matter.) As you play, remember that these are solid layers, so underneath that green tile is a white, a light gray and a dark gray tile.

With only 60 seconds to find a pair, it's easy to become frantic. The number of points you receive for making a pair equals the number of seconds left on the timer, so the faster you are, the higher your score. If the timer runs out, you won't get any points for the pair.

When you're absolutely stumped, press H for help. The Help function flashes a pair very briefly, so be sure you're watching. Of course, there's a penalty for help: 255 points. You can press H as often as you like, but it may not show you the best moves—and you could easily end up with a zero score! If there are no more pairs available, the Help function will tell you so.

Type in and save Listings 1 and 2 using the Checksum on page 57. To play Mah Jongg, simply load and run the boot program.

This game takes luck as well as skill. That's what keeps me coming back. I've just started my twelfth game of the night. This one's going to be tough. I should quit right now. Maybe start again. Maybe go to bed. I just can't put my joystick down—it's gonna be a long night! R

John Ryan is an air traffic control instructor. He claims that handling a sky full of planes can be just as challenging as Mah Jongg. We aren't sure we believe him.

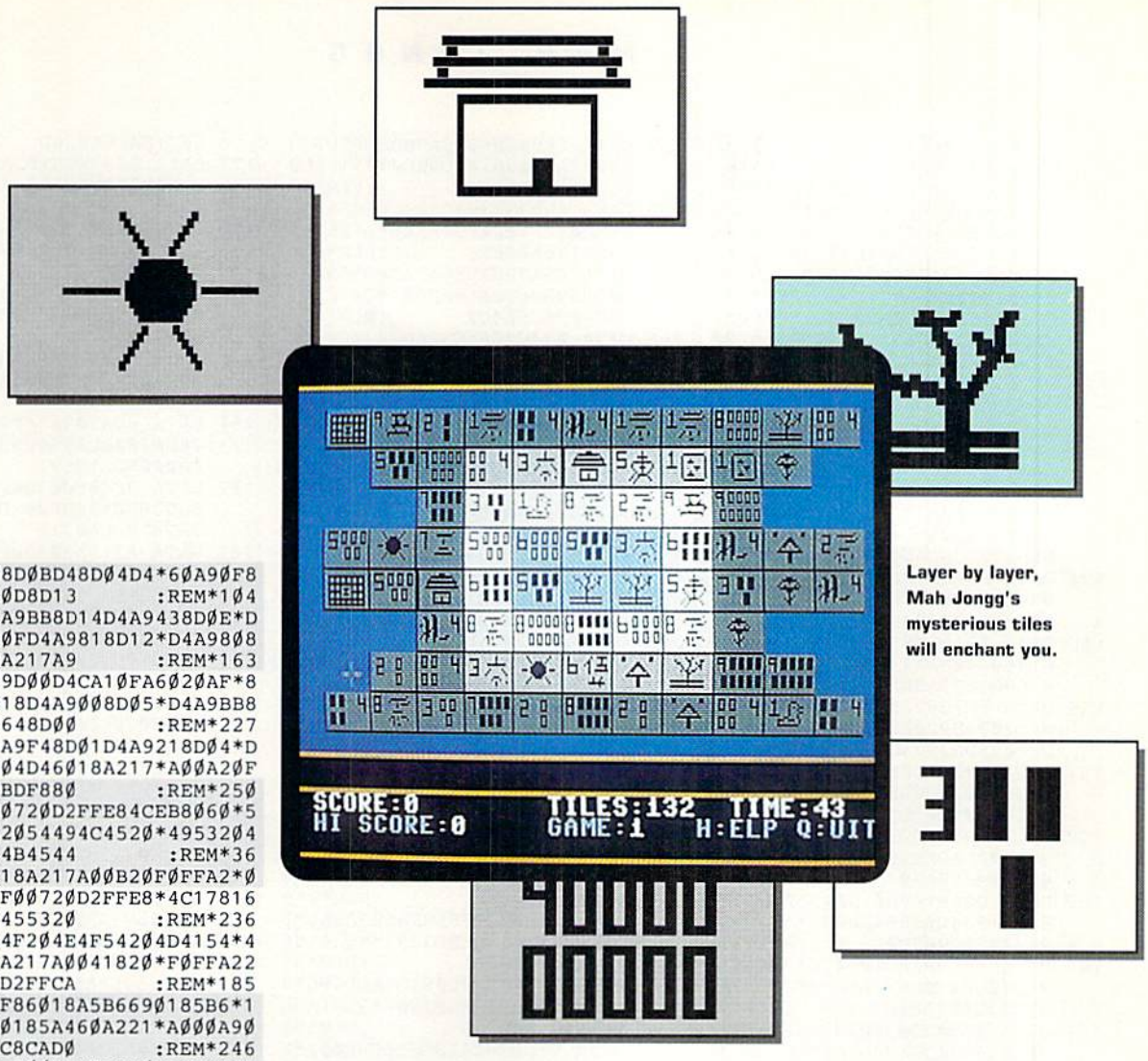
Listing 1. Mah Jongg boot program. (Also available on the January/February ReRUN disk. To order, call 800-343-0728.)

```
Ø REM BOOT MAJJONG - JOHN RYAN   :REM*227
1Ø IF A=Ø THEN A=1:LOAD"MAJJONG.ML",8,1   :REM*138
2Ø SYS 32768   :REM*236
```

Listing 2. Mah Jongg program. (Also available on the January/February ReRUN disk. To order, call 800-343-0728.)

```
Ø REM LISTING 2 CREATES (AND SHOULD NOT BE CALLED) MAJJONG.ML   :REM*71
5 OPEN 8,8,8,"MAJJONG.ML,P,W"   :REM*126
6 CT=Ø:PRINT"{SHFT CLR}":REM*56
1Ø READ A$:IF A$="-1" THEN CLOSE8:PRINT:PRINT"ALL DONE!":END   :REM*129
12 PRINT"{HOME}READING LINE "+STR$(CT):CT=CT+1   :REM*141
15 IF LEN(A$)<62 THEN 55   :REM*254
2Ø B$=MID$(A$,1,2Ø)+MID$(A$,22,2Ø)+MID$(A$,43,2Ø)   :REM*242
25 FOR I=1 TO 3Ø   :REM*181
3Ø C$=MID$(B$,(I*2)-1,2):H$=LEFT$(C$,1):L$=RIGHT$(C$,1)   :REM*2Ø9
35 H=VAL(H$):IF H$>"9" THEN H=ASC(H$)-55   :REM*85
4Ø L=VAL(L$):IF L$>"9" THEN L=ASC(L$)-55   :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);   :REM*67
5Ø NEXT:GOTO 1Ø   :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOTO 7Ø   :REM*184
6Ø IF LEN(A$)<42 THEN B$=LEFT$(A$,2Ø)+RIGHT$(A$,(LEN(A$)-21)):GOTO 7Ø   :REM*176
65 B$=LEFT$(A$,2Ø)+MID$(A$,22,2Ø)+RIGHT$(A$,LEN(A$)-42)   :REM*14Ø
7Ø FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEFT$(C$,1):L$=RIGHT$(C$,1)   :REM*14Ø
8Ø H=VAL(H$):IF H$>"9" THEN H=ASC(H$)-55   :REM*56
85 L=VAL(L$):IF L$>"9" THEN L=ASC(L$)-55   :REM*84
9Ø BY=H*16+L:PRINT#8,CHR$(BY);   :REM*148
95 NEXT:GOTO 1Ø   :REM*16Ø
1ØØ REM HEX DATA FOR MAJJONG   :REM*1Ø7
1Ø1 DATA ØØ8ØAD11DØ29EF8D11DØ*4CØB8ØA9ØØ85B5A9Ø85*B6A9ØØ85A3A93885A4AD   :REM*33
1Ø2 DATA ØEDC29FE8DØEDCA5Ø129*FB85Ø1A2Ø8AØØØB1B591*A3C8DØF92Ø4B81CADØF1   :REM*114
1Ø3 DATA A5Ø1Ø9Ø485Ø1ADØEDCØ9*Ø18DØEDCAD18DØ29FØØ9*ØE8D18DØ2ØE8814C5E82   :REM*86
1Ø4 DATA 2ØAF8ØA9ØØ8DØCD48DØ5*D4A9898DØDD48DØ6D4A9*5F8DØ8D4A99B8DØ1D4A9   :REM*22Ø
1Ø5 DATA Ø68D18D4A9218DØBD48D*Ø
```

RUN it right: **C-64; joystick in port 2**

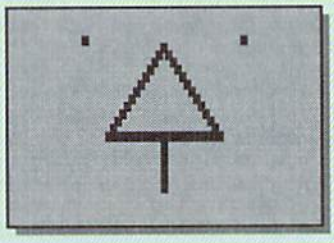


Layer by layer, Mah Jongg's mysterious tiles will enchant you.

```
    4D4A92Ø8DØBD48DØ4D4*6ØA9ØF8
    D18D4A9ØD8D13        :REM*1Ø4
1Ø6 DATA D4A9BB8D14D4A9438DØE*D
    4A9Ø38DØFD4A9818D12*D4A98Ø8
    D12D46ØA217A9        :REM*163
1Ø7 DATA ØØ9DØØD4CA1ØFA6Ø2ØAF*8
    ØA9Ø58D18D4A9ØØ8DØ5*D4A9BB8
    DØ6D4A9648DØØ        :REM*227
1Ø8 DATA D4A9F48DØ1D4A9218DØ4*D
    4A92Ø8DØ4D46Ø18A217*AØØA2ØF
    ØFFA2ØØBDF88Ø        :REM*25Ø
1Ø9 DATA FØØ72ØD2FFE84CEB8Ø6Ø*5
    4484154Ø254494C452Ø*4953Ø4
    24C4F434B4544        :REM*36
11Ø DATA ØØ18A217AØØB2ØFØFFA2*Ø
    ØBD2481FØØ72ØD2FFE8*4C17816
    Ø54494C4553Ø2Ø       :REM*236
111 DATA 444F2Ø4E4F542Ø4D4154*4
    348ØØ18A217AØØ4182Ø*FØFFA22
    ØA92Ø2ØD2FFCA        :REM*185
112 DATA DØF86Ø18A5B669Ø185B6*1
    8A5A469Ø185A46ØA221*AØØØA9Ø
    4993CØ3C8CADØ        :REM*246
113 DATA F9A9ØØ85A7A96Ø85A8A9*8
    885A9A97385AAA9EØAØ*ØØA6A8E
    4AA9ØØ8DØ1ØA6        :REM*251
114 DATA A7E4A9BØØA91A7E6A7DØ*E
    CE6A8DØE8A9FF8DØFD4*A98Ø8D1
    2D48D18D46ØAE        :REM*251
115 DATA DC96BD9Ø96859EBD9596*8
    59FBD9A968DB196A9ØØ*85A785A
    9A9Ø485A81869        :REM*147
116 DATA D485AAA2Ø4AØØØB1A929*Ø
    FCDB196FØØ7A9EØ919E*4CDB81B
    1A7919EC8DØE9        :REM*75
117 DATA E6A8E6AAE69FCADØDE6Ø*A
    96885FAA98D85FBA2CA*8EDØ96A
    2ØØAØØØB1FA8D        :REM*2Ø9
118 DATA D196A9ØØ859EA938859F*A
    DD196FØ1218A59E69Ø8*859EA59
    F69ØØ859FCED1        :REM*3
119 DATA 96DØEEE6FADØØ2E6FBAØ*Ø
    ØB1FA919EC8CØØ8DØF7*18A5FA6
    9Ø885FAA5FB69        :REM*234
12Ø DATA ØØ85FBCEDØ96DØB76Ø18*A
    5A76DD39685A7A5A869*Ø985A81
    8A5A96DD39685        :REM*96
121 DATA A9A5AA69ØØ85AA6ØA993*2
    ØD2FFA9ØØ8D2ØD8D21*DØA226A
    ØØØA9DF99Ø1Ø4        :REM*6Ø
122 DATA A9Ø899Ø1D899F9DAA9DE*9
    9F9Ø6C8CADØEAA92885*A7A9Ø48
    5A8A92885A9A9        :REM*197
123 DATA D885AAA9128DDØ96AØØØ*A
    9DD91A7A9Ø891A9C8A9*DC91A7A
    9Ø991A9AØ26A9        :REM*225
124 DATA DD91A7A9Ø891A9C8A9DC*9
    1A7A9Ø991A9A9288DD3*962Ø418
    2CEDØ96DØCDA9        :REM*123
125 DATA 2A85A7A9Ø485A8A92A85*A
    9A9D885AAA9128DDØ96*A9288DD
    396AØØØA9EØ91        :REM*8Ø
126 DATA A7A9Ø691A9C8CØ24DØF3*2
    Ø4182CEDØ96DØE9A2ØØ*8EDC962
    ØA181A94885A7        :REM*29
127 DATA 85A9A9Ø785A81869D485*A
    AA9288DD396A2Ø3AØØØ*A9DD91A
    7A9Ø891A9A9Ø9        :REM*191
128 DATA C891A9A9DC91A7882Ø41*8
    2CADØE6A92185A785A9*A9Ø785A
    81869D485AAAØ        :REM*58
129 DATA ØØA9DF91A7A9Ø891A9C8*C
    Ø26DØF3A96E85A785A9*A9Ø785A
    81869D485AAA2        :REM*131
13Ø DATA Ø3AØØØA9DD91A7A9Ø891*A
    9C8A9DC91A7A9Ø991A9*882Ø418
    2CADØE6A9C185        :REM*91
131 DATA A785A9A9Ø785A81869D4*8
    5AAAØØØA9DE91A7A9Ø8*91A9C8C
    Ø26DØF34C2886        :REM*9Ø
132 DATA A96885FAA98D85FBCAFØ*1
    58ED9618A5FA693685*FAA5FB6
    9ØØ85FBCED096        :REM*253
133 DATA DØEEA9Ø68DDØ96A9ØØAA*A
    8B1FA9DD49618A5FA69*Ø985FAA
    5FB69ØØ85FBE8        :REM*147
134 DATA CEDØ96DØE8A9ØØAAA8BD*D
    49691A7ADD29691A9E8*C8CØØ3D
    ØFØAØ28BDD496        :REM*149
135 DATA 91A7ADD29691A9C8E8CØ*2
    BDØFØ6ØA98285A7A994*85A8A9Ø
    Ø85A9A93Ø85AA        :REM*4Ø
136 DATA A94Ø8DD396A2Ø8AØØØB1*A
    791A9C8CØ3FDØF72Ø41*82CADØE
    FA9FF8D15DØA9        :REM*2Ø8
137 DATA ØØA8AAB9DE9699F8Ø7A9*Ø
    19927DØC8CØØ8DØFØAØ*ØØA2Ø88
    EDØ96A2ØØB9C8        :REM*2Ø3
138 DATA 969DØØDØA9DC9DØ1DØC8*E
    8E8CEDØ96DØED6Ø2Ø5A*81A9Ø88
    DDA96A9ØØA8AA        :REM*24
139 DATA 8DDB96ACDB96B9B3968D*C
    796EEDB96BD3A9785A7*85A9E8B
    D3A9785A81869        :REM*112
14Ø DATA D485AAE88EDD96A9ØB8D*D
    2962Ø6585AEDD96CEDA*96DØCE6
    ØA9Ø68DDA96A9        :REM*137
141 DATA ØØA8AA8DDB96ACDB96B9*B
    B968DC796EEDB96BD4A*9785A78
    5A9E8BD4A9785        :REM*132
142 DATA A81869D485AAE88EDD96*A
    9ØF8DD2962Ø6585AEDD*96CEDA9
    6DØCE6ØA9Ø48D        :REM*25Ø
143 DATA DA96A9ØØA8AA8DDB96AC*D
    B96B9C1968DC796EEDB*96BD569
    785A785A9E8BD        :REM*21
144 DATA 569785A81869D485AAE8*8
    EDD96A9Ø18DD2962Ø65*85AEDD9
    6CEDA96DØCE6Ø        :REM*1
145 DATA A9Ø28DDA96A9ØØA8AA8D*D
    B96ACDB96B9C5968DC7*96EEDB9
    6BD7C9785A785        :REM*187
146 DATA A9E8BD7C9785A81869D4*8
    5AAE88EDD96A9Ø38DD2*962Ø658
    5AEDD96CEDA96        :REM*25
147 DATA DØCE6Ø2Ø88852ØAØ83CE*C ►
```

```
    796F01718A5A76903 85*A785A9A
    5A869008 5A818      :REM*157
148 DATA 69D485AA4C65856020 99*8
    5A8AACABD3C03F0F5DE*3C0398A
    A60AD1BD4AACA       :REM*61
149 DATA D0FDAD1BD4C9019 0F2C9*2
    2B0EE60A9C78DF807A9*048D27D
    0A9A28D00D0A9       :REM*236
150 DATA 768D01D0A9018D15D060*3
    8A5A7EDD39685A785A9*A5A8E90
    085A81869D485       :REM*47
151 DATA AA60AD11D029EF8D11D0*A
    9048DAD968DAE968D9F*96A9008
    DAF96A9018DDC       :REM*20
152 DATA 9620668420A181EEDC96*2
    0A8842 0A181EEDC9620*E7842 0A
    181EEDC962026       :REM*138
153 DATA 852 0A181A9848DB002AD*1
    1D009108D11D060A210*A000A90
    099A702C8CAD0       :REM*94
154 DATA F9A9018DA7022 0DC852 0*0
    8842 0E4FFF0FB2091 89*20DE89A
    9008D15D020AC       :REM*198
155 DATA 85A95085A785A9A9 0585*A
    81869D485AAA900AAA8*20DBFFA
    93C8D3697A90A       :REM*136
156 DATA 8D7B9720 3F8A209 08620*D
    C852091892 0DE89A900*8D10D08
    DB1028DB2024C       :REM*190
157 DATA 5086AD00DC4AB021ADAE*9
    6C901F073CEAE96AEB0*9638AD0
    1D0E9109D01D0       :REM*17
158 DATA A9508DD3962 0C6854C05*8
    94AB021ADAE96C908F0*4FEEAE9
    6AEB09618AD01       :REM*36
159 DATA D0691 08D01D0A95 08DD3*9
    62041824C05894AB035*ADAD96C
    900F02BC908D0       :REM*215
160 DATA 10A9008D10D0CEAD96A9*E
    78D00D04C0887CEAD96*AEB0963
    8AD00D0E9188D       :REM*47
161 DATA 00D0A9038DD3962 0C685*4
    C05894AB035ADAD96C9*0BF0F3C
    907D01 0A9018D      :REM*144
162 DATA 10D0EEAD96A9008D00D0*4
    C4087AEB09618AD00D0*69188D0
    0D0EEAD96A903       :REM*43
163 DATA 8DD3962041824C05894A*B
    0FA2037 81AEAF96A000*B1A9290
    F9DA196AEAF96       :REM*216
164 DATA A5A99DA996A5AA9DAB96*A
    000B99A96DDA196F004*C84C6C8
    78C9F96C904D0       :REM*134
165 DATA 034C7088C906D00 34C70*8
    8AC9F96B99096859EB9*9596859
    FA5A748A5A848       :REM*58
166 DATA 38A5A7E9008DB196A5A8*E
    9048DB29618A59E6DB1*96859EA
    59F6DB296859F       :REM*28
167 DATA ACAF9638A59EE9E8992A*9
    7A59FE903992C97A5A7*9930 97A
    5A8993297AE9F       :REM*48
168 DATA 96CABD9A96992E97A000*A
    EAF96B1A79D349738A5*9EE9038
    59EA59FE9 085       :REM*210
169 DATA 9FA000B19EC9E0F02EA0*0
    6B19EC9E0F0262 0BA80*20E180A
    DAF96D034C1D        :REM*229
170 DATA 8820 6A89A9008DAF9668*8
    5A81869D485AA6885A7*85A94C0
    589ADAF96F015       :REM*254
171 DATA A201A000B93497DD3497*F
    0092 0BA80200D814C0D*886885A
    81869D485AA68       :REM*63
172 DATA 85A785A9A904A0009 1A9*C
    8C003D0F9A02891A9C8*C02BD0F
    9ADAF96D006EE       :REM*164
173 DATA AF964C0589A9008DAF96*2
    0588 0A200BD2E978DD0*96BD2A9
    7859E1869E885       :REM*215
174 DATA B5BD2C97859F6903 85B6*B
    D309785A385BEBD3297*85A4186
    9D485BFA000B1       :REM*55
175 DATA 9E91A3A9E091B5ADD096*9
    1BEC8C00 3D0EEA028B1*9E91A3A
    9E091B5ADD096       :REM*97
176 DATA 91BEC8C02BD0EEE8E002*D
    0A9ADB002C902F05938*E9028DB
    0021 8ADB1026D      :REM*73
177 DATA 36978DB102ADB2026900*8
    DB2022 0DE89A93C8D36*97A90A8
    D7B97A9028D37       :REM*180
178 DATA 97A055A2FFCAD0FD88D0*F
    8CE7B97D01 0A90A8D7B*97AD369
    7F006CE36972 0      :REM*188
179 DATA 3F8AA5CBC93EF00AC91D*D
    0032 05B8A4C90862 0BA*8C38ADB
    102EDB3028DD0       :REM*42
180 DATA 96ADB202EDB4020DD096*9
    00CADB1028DB302ADB2*028DB40
    218ADA7026901       :REM*102
181 DATA 8DA702A9008DB2028DB1*0
    26 0A200BDA996859EBD*AB96859
    FA000BDA19691       :REM*246
182 DATA 9EC8C003D0F9A028919E*C
    8C02BD0F9E8E002D0DC*6020CB8
    9A9018D86 0218      :REM*183
183 DATA A215A0032 0F0FFA200BD*E
    696F00720D2FFE84CA3*89A9038
    D86 0218A216A0      :REM*45
184 DATA 032 0F0FFA200BD0697F0*0
    72 0D2FFE84CBE896 0A2*00A9209
    D4B079D73079D       :REM*121
185 DATA 9B07E8E022D0F26 0A215*A
    018182 0F0FFA9018D86*02AEB00
    2A9002 0CDBDA9      :REM*224
186 DATA 2020D2FFA215A00918 20*F
    0FFAEB102ADB2022 0CD*BDA9202
    0D2FFA92020D2       :REM*252
187 DATA FFA216A0C182 0F0FFAE*B
    302ADB4022 0CDBDA92 0*20D2FFA
    216A017182 0F0      :REM*221
188 DATA FFAEA702A9002 0CDBDA9*2
    02D2FF6018A215A022*182 0F0F
    FAE3697A90020       :REM*40
189 DATA CDBDA92020D2FFA92020*D
    2FF60A9008D3997A908*8D8896A
    954859E85B5A9       :REM*81
190 DATA 04859F18A59F69D485B6*A
    000B1B529 0F8D84968D*8E96B19
    EC9E0D05DC8C8       :REM*203
191 DATA C8C021D0E9CE8896F01B*1
```

Strategy & Advice from a Mah Jongg Junkie



I couldn't help it. The next thing I knew I was playing Mah Jongg all the time—even when I was supposed to be working. I would lie awake at night picturing a giant Mah Jongg board on the ceiling. I would forget to feed my rabbit, Nigel. Because of my experience, I think I can help others. I've been there.

•There are two pairs of each tile.

•Spend a minute reviewing the screen before starting a game. You might lose a few points initially, but learning the board and planning your first few moves will get you off to a good start and you will quickly recover any lost points.

•Keep as many tiles active as possible. An active tile has either its left or right side free. Long lines of tiles are traps that keep large sections of your board inactive. At the beginning of each game, I pick matches from the long rows at the top, bottom and center of the screen to reduce the number of trapped tiles.

•Keep the board balanced. Having tiles trapped in stacks is as damaging as having them trapped in rows, so as you pull in the long rows, also work on shortening the stacks. Start with the green tiles. By mid-game, you should have the top, bottom and center rows pulled in even with the central square of the pyramid, and have several of the green and white tiles removed.

•Maximize the layers. Don't make the mistake of removing all of one layer. To keep as many active tiles as possible, keep a variety of levels.

•If you have a choice, remove the tiles that will leave you with one or two new open tiles.

•When you make a pair, there's a good chance that the newly uncovered tiles will lead straight to another match. Check them out before looking over the rest of the board.

•Removing one pair of tiles may prevent accessing others later in the game; look for other matching tiles before you make the pick.

•Toward the end of the game, keep the rows and stacks short.

•Don't ask for help until you think the game is over. It's better to stare at the board for ten minutes than to ask for help and lose an additional 255 points.

—Janice Greaves

MAH JONGG

```
    8A59E695Ø859E85B5A5*9F69ØØ8
    59F18A59F69D4          :REM*115
192 DATA 85B6AØØØ4C788A2Ø3781*A
    9ØA8D86Ø218A217AØØB*2ØFØFFA
    2ØØBDD38AFØØ7          :REM*116
193 DATA 2ØD2FFE84CC18AA9Ø18D*8
    6Ø26Ø4E4F2Ø4D4F5645*532Ø5Ø4
    F535349424C45          :REM*227
194 DATA ØØ8D38978C8A96CØØØFØ*3
    1888888B1B529ØF8D62*97CD849
    6FØØ52Ø878CBØ          :REM*56
195 DATA 1DAC8A96C8C8C8B1B529*Ø
    F8D6297CD8496FØØ52Ø*878CBØØ
    6AC8A964C888A          :REM*12
196 DATA 2Ø388BAC8A96AD3997FØ*Ø
    A2ØBA8Ø2ØEF8B2Ø4C8C*6Ø4C888
    AA95485A385FD          :REM*8Ø
197 DATA A9Ø485A4A9Ø88D8996A5*A
    41869D485FEAØØØB1FD*29ØF8D8
    F96B1A3CD3897          :REM*16Ø
198 DATA FØ2AC8C8C8CØ21DØEBCE*8
    996FØ1B18A5A3695Ø85*A385FDA
    5A469ØØ85A418          :REM*161
199 DATA A5A469D485FEAØØØ4C5Ø*8
    B4CE98B38A59EE5A38D*6197A59
    FE5A4ØD6197DØ          :REM*181
2ØØ DATA ØB8C6197AD8A96CD6197*F
    ØBA8C8B96B1FD29ØF8D*8496CØØ
    ØFØ31888888B1          :REM*251
2Ø1 DATA FD29ØF8D6297CD8496FØ*Ø
    52Ø878CBØ1DAC8B96C8*C8C8B1F
    D29ØF8D6297CD          :REM*251
2Ø2 DATA 8496FØØ52Ø878CBØØ6AC*8
    B964C5E8BA9Ø18D3997*6ØA9ØØ8
    D39976ØA9Ø58D          :REM*19
2Ø3 DATA 82968D8396AD8A968D8C*9
    6AD8B968D8D96A2Ø3AD*8296AC8
    C9691B5AC8D96          :REM*79
2Ø4 DATA AD839691FDEE8C96EE8D*9
    6CADØE7A2Ø318AD8C96*69258D8
    C9618AD8D9669          :REM*197
2Ø5 DATA 258D8D96AD8296AC8C96*9
    1B5AC8D96AD839691FD*EE8C96E
    E8D96CADØE76Ø          :REM*67
2Ø6 DATA A2FFAØFF88DØFDCADØF8*A
    D8E968D8296AD8F968D*83962ØF
    78BADB2Ø2DØØ8          :REM*97
2Ø7 DATA A9ØØ8DB1Ø24C758CCEB2*Ø
    22ØF8896Ø5Ø52455353*2Ø414E5
    92Ø4B4559ØØA2          :REM*25
2Ø8 DATA ØØBD9A96CD8496FØØ4E8*4
    C898C8E5F97A2ØØBD9A*96CD629
    7FØØ4E84C9A8C          :REM*3Ø
2Ø9 DATA 8E6Ø97AD6Ø97FØØAAD5F*9
    7CD6Ø97BØØ2186Ø386Ø*2Ø3781A
    9Ø58D86Ø218A2          :REM*15Ø
21Ø DATA 17AØØ72ØFØFFA2ØØBD4D*8
    DFØØ72ØD2FFE84CCC8C*2ØE4FFC
    94EDØ64A9ØØ8D          :REM*19
211 DATA 15DØA9932ØD2FFA9ØE8D*8
    6Ø2A2Ø6AØØD182ØFØFF*A2ØØBD6
    397FØØ72ØD2FF          :REM*15Ø
212 DATA E84CF88CA2Ø8AØ12182Ø*F
    ØFFA9422ØD2FFA9592Ø*D2FFA2Ø
    AAØØF182ØFØFF          :REM*1Ø2
213 DATA A2ØØBD7197FØØ72ØD2FF*E
    84C2Ø8DA9ØC8DDØ96A2*FFAØFF8
    8DØFDCADØF8CE          :REM*2Ø2
214 DATA DØ96DØF14CE2FCC959D0*9
    1A9Ø18D86Ø26Ø444F2Ø*594F552
    Ø574953482Ø54          :REM*184
215 DATA 4F2Ø5Ø4C41592Ø414741*4
    94EØØØØØØ7F7B737B7B*7B7B6Ø1
    BFFFFF8F7F5F7          :REM*1Ø6
216 DATA F7F71CFFFFFF7F9F7F9F*7
    F1D7F7E7E7E7F7F7FØØ*1ECF31F
    FØØFFFFFFØØ1F          :REM*18Ø
217 DATA 7FBFBF7FFFFFFFØØ217F*7
    F7Ø7E7E7Ø777722FFFF*FCFDFDF
    DFCFF23FFFF7F          :REM*6
218 DATA 7F7F7F7FFF247Ø7F7F7F*7
    F7F7FØØ25FCFDFDFDFC*FFFFØØ2
    67F7F7F7F7FFF          :REM*167
219 DATA FFØØ277F7F6Ø7E7E787E*7
    E28FFFFF1F5F5F5F1FF*29FFFF8
    FAFAFAF8FFF2A          :REM*91
22Ø DATA 6Ø7F7F7F7F7F7FØØ2BFE*F
    EFEFEFEFFFFØØ2D3FBF*BFBF3FF
    FFFØØ2F7F636B          :REM*124
221 DATA 6B6B637F7F3BFF1F5F5F*5
    F1FFFFF3CFFDFDBDBC3*FBFBFB3
    D636B6B6B637F          :REM*19Ø
222 DATA 7FØØ3E1F5F5F5F1FFFFF*Ø
    Ø3FFFFFFFFFFFFFFFØØ*4Ø7F6Ø6
    F6F6Ø7E7E6Ø41          :REM*85
223 DATA FFC6D6D6D6C6FFF142FF*3
    1B5B5B531FF8F437F7F*7F7F7F7
    F7FØØ44F5F5F5          :REM*62
224 DATA F1FFFFFFØØ45AFAFAF8F*F
    FFFFFØØ467F6F6F6F6Ø*6E6E6Ø4
    7FFC6D6D6D6C6          :REM*139
225 DATA FFC648FF31B5B5B531FF*3
    1497F7F7F7F7F7FØØ*4AD6D6D
    6C6FFFFFFØØ4B          :REM*8Ø
226 DATA B5B5B531FFFFFFØØ4C7F*4
    37B7B7B7B7B7B4DFF11*5555551
    1FFFF4EFF1155          :REM*179
227 DATA 555511FFFF4F7F7F7F7F*7
    F7F7FØØ5Ø1155555511*FFFFØØ5
    11F5F5F5F1FFF          :REM*113
228 DATA FFØØ527F435B5B435B5B*4
    353FF1155555511FFFF*54FF115
    5555511FFFF55          :REM*195
229 DATA 7F7F7F7F7F7F7FØØ5611*5
    5555511FFFFØØ571155*555511F
    FFFØØ587F435B          :REM*158
23Ø DATA 437B7B7B7F59FF115555*5
    511FFFF5AFF11555555*11FFFF5
    B717575575717F         :REM*34
231 DATA 7FØØ5C1155555511FFFF*Ø
    Ø5D1155555511FFFFØØ*5E7F7F6
    Ø6D6D6Ø6D6D5F          :REM*185
232 DATA FFFFØØB6B6ØØBEA26ØFF*F
    FØ3DBDBØ3DBDB616Ø6D*6D6Ø6D6
    Ø7FØØ6236A2BE          :REM*216
233 DATA ØØB6ØØFFØØ63Ø3DBDBØ3*D
    BØ3FFØØ647F7B737B7B*7B7B6Ø6
    5FFFFEØDFDDD8          :REM*254
234 DATA DFDF66FFFFØ7FBFBFBFB*1
    B677F7F7F7F7F7F7FØØ*68DFDDD
    8DFEØFFFFØØ69          :REM*2Ø6
235 DATA BBFBFBFBØ7FFFFØØ6A7F*7
    F7Ø7E7E7Ø77776BFFFF*FCFCFCF
    CFCFF6CFFFF7F          :REM*238
236 DATA 7F7F7F7FFF6D7Ø7F7F7F*7
    F7F7FØØ6EFCFCFCFCFC*FFFFØØ6
    F7F7F7F7F7FFF          :REM*146
237 DATA FFØØ7Ø7F7F6Ø7E7E787E*7
    E71FFFFF1F1F1F1F1FF*72FFFF8
    F8F8F8F8FFF73          :REM*146
238 DATA 6Ø7F7F7F7F7F7FØØ74FE*F
    EFEFEFEFFFFØØ753F3F*3F3F3FF
    FFFØØ767F6363          :REM*71
239 DATA 6363637F7F77FF1F1F1F*1
    F1FFFFF78FFDFDBDBC3*FBFBFB7
    963636363637F          :REM*151
24Ø DATA 7FØØ7A1F1F1F1F1FFFFF*Ø
    Ø7BFFFFFFFFFFFFFFØØ*7C7F6Ø6
    F6F6Ø7E7E6Ø7D          :REM*226
241 DATA FFC6C6C6C6C6FFF17EFF*3
    131313131FF8F7F7F7F*7F7F7F7
    F7FØØ8ØF1F1F1          :REM*25
242 DATA F1FFFFFFØØ818F8F8F8F*F
    FFFFFØØ827F6F6F6F6Ø*6E6E6Ø8
    3FFC6C6C6C6C6          :REM*46
243 DATA FFC684FF3131313131FF*3
    1857F7F7F7F7F7F7FØØ*86C6C6C
    6C6FFFFFFØØ87          :REM*13
244 DATA 31313131FFFFFFØØ887F*4
    37B7B7B7B7B7B89FF11*1111111
    1FFFF8AFF1111          :REM*113
245 DATA 111111FFFF8B7F7F7F7F*7
    F7F7FØØ8C1111111111*FFFFØØ8
    D1F1F1F1F1FFF          :REM*7Ø
246 DATA FFØØ8E7F435B5B435B5B*4
    38FFF1111111111FFFF*9ØFF111
    1111111FFFF91          :REM*119
247 DATA 7F7F7F7F7F7F7FØØ9211*1
    1111111FFFFØØ931111*111111F
    FFFØØ947F435B          :REM*17
248 DATA 437B7B7B7F95FF111111*1
    111FFFF96FF11111111*11FFFF9
    771717171717F          :REM*231
249 DATA 7FØØ9811111111111FFFF*Ø
    Ø9911111111111FFFFØØ*9A7F7F7
    F7F7F7E7F7F9B          :REM*86
25Ø DATA FFFFE38Ø77DEØØE39CFF*F
    FFFFF7FBF7FFF9D7F7F*7F7F7F7
    F7FØØ9EF7F5D3          :REM*198
251 DATA E7F7FFFFØØ9FFFFFFFFF*F
    FFFFFØØAØ7F79797F7F*7F7F7FA
    1FFFFFFF3E1CC          :REM*241
252 DATA 9E7FA2FFCFCFFFFFF7F*B
    FA37E7F7F7F7F7F7FØØ*A4ØØF3F
    3F3F3FFFFØØA5          :REM*195
253 DATA 1FFFFFFFFFFFFFØØA67F*7
    F7D7E7F7F7F7FA7FFED*F37BBBD
    7A4F3A8FFFCF           :REM*1ØØ
254 DATA 5F9F5FFFFFA97F7F7Ø7F*7
    Ø7F7FØØAAF7F7ØØF7ØØ*FFFFØØA
    BFFFFØFFFØFFF          :REM*161
255 DATA FFØØAC7F7E7F7F7F7F78*7
    FADFFFF7FA1CØ8Ø8Ø8Ø*AEFFDFB
    F7FFF7F477FAF          :REM*198
256 DATA 7F7F7F7E7F7F7FØØBØCØ*A
    17FFFFFFFFFØØB1FF7F*BFDFFFF
    FFFØØB27F7B73          :REM*161
257 DATA 7B7B7B7B6ØB3FFFFEØFF*8
    ØFFFFFØB4FFEF1FF7ØF*FFFF7FB
    57F7F7F7F7F7F          :REM*86
258 DATA 7FØØB6FFEDDDBFFCFFFF*Ø
    ØB7FFDFDFFFFFFFFFØØ*B87F7F7
    Ø7E7E7Ø7777B9          :REM*39
259 DATA FFFFEØFFFEFFFFFØBAFF*E
    F1FF7ØFFFFF7FBB7Ø7F*7F7F7F7
    F7FØØBCFFE5D5          :REM*251
26Ø DATA F7F4FFFFØØBDFFDFDFFF*F
    FFFFFØØBE7F7F6Ø7E7E*787E7EB
    FFFFFFFFFFØFF          :REM*169
261 DATA FBF7CØFF7F7F7FØ7FFEF*F
    7C16Ø7F7F7F7F7F7FØØ*C2EFFEF
    DFFFFFFFFØØC3          :REM*219
262 DATA FB3FDF7B7FFFFFØØC47F*7
    F7379794979978C5FF3F*9F9F9F9
    F1F9FC6FFDFDB          :REM*254
263 DATA DBC3FBFBFBC771695B7B*7
    F7F7FØØC89F9EBØBFFF*FFFFØØC
    9FF7FFFFFFFFF          :REM*147
264 DATA FFØØCA7F6Ø6F6F6Ø7E7E*6
    ØCBFFFEFEF8FEEØDEDC*CCFFFFF
    F3FFFØFF777CD          :REM*166
265 DATA 7F7F7F7F7F7F7FØØCEEE*F
    6E8DBB7EFFFØØCFEFDF*3FDFEFF
    FFFØØDØ7F6F6F          :REM*19Ø
266 DATA 6F6Ø6E6E6ØD1FFFDFBF3*E
    BFBFBFBD2FF83EFEF83*FBØ1FFD
    37F7F7F7F7F7F          :REM*147
267 DATA 7FØØD4FFFEFEF8FFFFFF*Ø
    ØD5FFEFDFØ7DFFFFFØØ*D67F437
    B7B7B7B7B7BD7          :REM*5
268 DATA FFFFEØFFFDFDFFFØD8FF*E
    F1FFFFFFFFF6FD97F7F*7F7F7F7
    F7FØØDAFFCØFF          :REM*35
269 DATA FFFFFFFFØØDBFF1FFFFF*F ►
```

```
    FFFFF00E17F435B5B43*5B5B43E
    2FFFFE0DFFDFD          :REM*80
270 DATA FFF0E3FFEF1FF70FFFFF*7
    FE47F7F7F7F7F7F700*E5FFE5D
    5F7F4FFFF00E6          :REM*181
271 DATA FF1FEFFFFFFFF00E73F*3
    F3F3E3C3D383FE8FFF1*00FF00F
    F00FFE9FFFF1F          :REM*241
272 DATA EF07F703FFEA3F3F3F*3
    F3F3F00EB80BFBBBB80*FFFF00E
    C3FBFBFBF3FFF          :REM*56
273 DATA FF00ED7F435B437B7B7B*7
    FEEFFFFE0FBFBF9E0F7*EFFFEF1
    FBFDF9F07F3F0          :REM*229
274 DATA 7F7F7F7F7F7F700F17B*8
    0BFFFFFFFFF00F2F70F*EFFFFFF
    FFF00DCC0C0C0          :REM*204
275 DATA C0C0C0C0C0DD03030303*0
    3030303DEFFFF000000*000000D
    F000000000000          :REM*197
276 DATA FFFF0000000000000000*0
    004002006006007006E0*0781E00
    6C360006666006         :REM*247
277 DATA 3C600618600600600600*6
    0060060060060260260*3E03E00
    000000000000           :REM*17
278 DATA 0000000000000000000000*0
    000000000003F0000400*800180 6
    00180600180 60         :REM*142
279 DATA 0180600 1FFE00180600 1*8
    0600180600180600180*6000980 6
    00783E0000000          :REM*207
280 DATA 000000000000000000000*0
    000000000000000000007*81E0098
    0600180600180          :REM*213
281 DATA 600180600180600 1FFE0*0
    180600180600180600 1*800180
    0600980600783          :REM*19
282 DATA E0000000000000000000*0
    000000000000000000*0000000
    007FC000C6000          :REM*140
283 DATA 0060000060000060000*6
    000006000006000006 0*0106600
    1C06000C06000          :REM*123
284 DATA C06000FFF000000000000*0
    000000000000000000*0000000
    000000000FFE0          :REM*126
285 DATA 0180600180600180600 1*8
    0600 1806001806001 80*600180 6
    00180600180 60         :REM*144
286 DATA 0180600180600 0FFC000*0
    000000000000000000*0000000
    000000000000           :REM*129
287 DATA 001C01E006006007006 0*0
    780600 6C06006606006*3060006 1
    8600 60C600606         :REM*20
288 DATA 600603600601E0260 0E0*1
    E006000000000000000*0000000
    000000000000           :REM*44
289 DATA 000000000000FF8000 18C*0
    00180000180000180000*0180000
    184000187E001          :REM*8
290 DATA 8460018060018060180*6
    00180600 3FFE0000000*0000000
    000000000000           :REM*230
291 DATA 0C00000C00000C00000C*0
    000F3C000F3C0000C00*000C000
    00C00000C0000          :REM*113
292 DATA 000000000000000000000*0
    000000000000000000000*0000000
    000000000000           :REM*136
293 DATA 000000000000000000000*0
    000000000000000000E8*D0B8A06
    063676B6F060B          :REM*246
294 DATA 0F0103000000000000000*0
    000000000000000000000*0000000
    B09070B0B07 09         :REM*192
295 DATA 0B05050505050505050 5*0
    503030066788AA4B6C8*DAEC000
    000000000000           :REM*221
296 DATA 0000000000000C0C1C2C3*C
    4C5C6C653434F52453A*2020202
    020202020202054        :REM*228
297 DATA 494C45533A2020202020*5
    4494D453A0048492053*434F524
    53A2020202020          :REM*240
298 DATA 2047414D453A2020202 0*4
    83A454C5020513A5549*5400000
    000000000000           :REM*35
299 DATA 00000000000000000054 04*A
    704FA04440594 05EA05*3706840
    6AD04FD044D05          :REM*65
300 DATA 9D05ED053D06FD044D05*9
    D05ED05000000000004D*4148204
    A4F4E47472056          :REM*159
301 DATA 2E30004A4F484E2052 59*4
    14E0000500 5A00 59D05*ED0500
                           :REM*68
302 DATA -1                :REM*156 ■
```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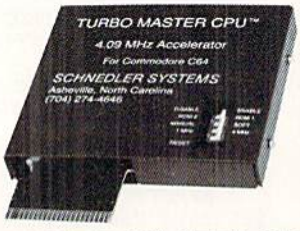

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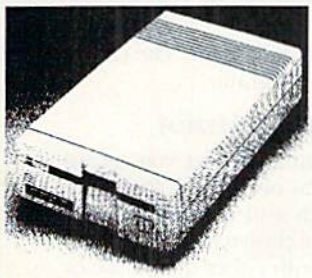

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Past, Present & Future

This point-and-click calendar covers the first to the 21st century (and beyond), and lets you keep full-page daily memos along the way.

By JAY TAPLIN

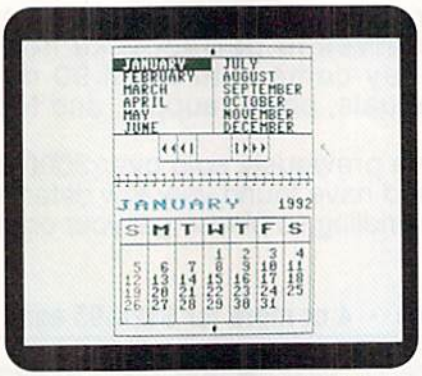
You've heard of traveling back to the future? Well, now you can also fly forward to the past! With Graphic Calendar 64 and a 1351 mouse, you can access accurate, visual calendars from the year 1 A.D. to the year 10,000 with the same ease you would expect only from GEOS. If you don't have a mouse, you can just as easily use the cursor keys to span the ages. And, while the time flies by, you can stop along the way and post daily memos that can be read later.

Type in Listing 1 using the Checksum program on page 57 to catch typing errors, and save it to disk as CALENDAR. Next, run it to create the machine language file Calendar.ML. Then, type in Listing 2, and save it as CAL.

To run Graphic Calendar, load and run CAL. A green arrow pointer and a bitmapped image of a traditional monthly calendar will appear on the screen.

Traveling by Mouse

To use a 1351 mouse with the program, also type in Listing 3. (This is a slightly modified version of Commodore's driver program that comes with the 1351.) Once you have it typed in and saved to disk, load and run the driver each time before running CAL, making sure you have the mouse already plugged into port 1.



Calendar could be a point-and-click daily planner, a journal, even a historical record.

To make a selection, press either the left mouse button or the RETURN key. To change the month appearing on the screen, move the pointer to the month you want and select it in the same way.

Beneath the list of months are four arrow icons that control the year. The outermost arrows change the year by ten, while the innermost change the year by one. As you might expect, the arrows on the left decrease the year, whereas the arrows on the right increase it. The center button exits the program.

Full-Screen Daily Memos

Graphic Calendar will let you record memos for any day of any year. To do this, select the month and year, then move your cursor to the chosen date. When you select the date (with either the mouse or the RETURN key), you enter a screen editor. If a memo for that day already exists, it instantly appears on the screen, with the cursor at the end of the memo.

Your input is limited to one full screen, but you can scroll past the bottom. Be forewarned, however: Whenever you scroll past the bottom, anything you have on the top line is erased. After typing the memo, press the BACK-ARROW key to exit. The memo will be saved to the current storage device.

Using Graphic Calendar, you'll never miss another business meeting, dinner engagement, baseball game . . . or dentist's appointment. Have a Happy New Year—for centuries to come! R

Jay Taplin has punctually contributed timesaving tricks to our Magic column. Although he previously has been published in ReRUN, this is his first program for RUN.

Listing 1. Calendar program. (Available on the January/February ReRUN disk. To order, call 800-343-0728.)

```
Ø REM THIS LIST 1 CREATES (AND
  SHOULD NOT BE CALLED) CALENDA
  R.ML                    :REM*176
5 OPEN 8,8,8,"CALENDAR.ML,P,W"
                          :REM*134
6 CT=Ø:PRINT"{SHFT CLR}":REM*56
1Ø READ A$:IF A$="-1" THEN CLOS
  E8:PRINT:PRINT"ALL DONE!":EN
  D                       :REM*129
12 PRINT"{HOME}READING LINE "+S
  TR$(CT):CT=CT+1         :REM*141
15 IF LEN(A$)<62 THEN 55
                          :REM*254
2Ø B$=MID$(A$,1,2Ø)+MID$(A$,22,
  2Ø)+MID$(A$,43,2Ø)      :REM*242
25 FOR I=1 TO 3Ø          :REM*181
3Ø C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                          :REM*2Ø9
35 H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55               :REM*85
4Ø L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55               :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);
                          :REM*67
5Ø NEXT:GOTO 1Ø           :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOT
  O 7Ø                    :REM*184
6Ø IF LEN(A$)<42 THEN B$=LEFT$(
  A$,2Ø)+RIGHT$(A$,(LEN(A$)-21
  )):GOTO 7Ø              :REM*176
65 B$=LEFT$(A$,2Ø)+MID$(A$,22,2
  Ø)+RIGHT$(A$,LEN(A$)-42)
                          :REM*14Ø
7Ø FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                          :REM*14Ø
8Ø H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55               :REM*56
85 L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55               :REM*84
9Ø BY=H*16+L:PRINT#8,CHR$(BY);
                          :REM*148
95 NEXT:GOTO 1Ø           :REM*16Ø
```

RUN it right: **C-64; 1351 mouse optional**

```
100 REM HEX DATA FOR CALENDAR.M
    L                          :REM*84
101 DATA 008040A088A9188D18D0*A
    93B8D11D0A9C88D16D0*60A9158
    D18D0A91B8D11              :REM*218
102 DATA D0A9C88D16D0A9932002D2*F
    F60A000A090199000499*FA0499F
    40599EE06C8C0              :REM*69
103 DATA FAD0EFA000A961991106*C
    8C012D0F8A000A92199*6220699B
    2060 99DA0699002           :REM*189
104 DATA 07992A07995207997A07*C
    8C002D0E66020E4FFC9*00F0F96
    0A900085FBA920             :REM*243
105 DATA 85FCA900A000A900091FB*C
    8D0F9E6FCA5FCC940D0*EF60A9F
    F91FB18A5FB69              :REM*28
106 DATA 0885FBA5FC690085FCCA*D
    0EC6086FB84FCA216A0*0760A24
    8A0200180200               :REM*166
107 DATA 8C80A288A0212 0A18020*8
    C80A208A0292 0A18020*8C80A20
    8A03D20A18020              :REM*184
108 DATA 8C8060B1FB05FD91FBC8*C
    008D0F5A0001 8A5FB69*4085FBA
    5FC6901 85FCCA             :REM*134
109 DATA D0E360A9018 5FDA94085*F
    BA9208 5FCA007A2182 0*D380A98
    085FDA9F885FB              :REM*133
110 DATA A92085FCA007A2182 0D3*8
    0A901 85FDA91885FBA9*2385FCA
    206A0002 0D380             :REM*160
111 DATA 60A216A9 0885FBA92E85*F
    CA000B9F88891FBC8C0*0 8D0F61
    8A5FB690885FB              :REM*49
112 DATA CAD0EA60AD0048DA802*8
    CAB02A200A000182 0F0*FFADAB0
    22 0D2FFAD0004             :REM*86
113 DATA 84FCAEA8028E0004 0A26*F
    C0A26FC0A26FC85FB18*A5FC69D
    085FCAD0EDC29              :REM*128
114 DATA FE8D0EDCA5 129FB85 1*A
    000B1FB990089C8C008*D0F6A50
    1090485 1AD0E              :REM*41
115 DATA DC0918D0EDC6 204C81*A
    0008CA9028CAA02A200*A9808DA
    702B9 0892CA7              :REM*201
116 DATA 02D0154EA702E8E004D0*1
    9ADA9028DAA02A9008D*A902F0E
    3ADA9021D0889              :REM*113
117 DATA 8DA924CC381E008D0D3*9
    8EAA8ADAA0291A39818*6908A8A
    DA90291A39838              :REM*209
118 DATA E908EAA8C8C008F00AA9*0
    08DA9028DAA02F0A560*A90485F
    DA9008DAC02A9              :REM*111
119 DATA C885A3A93185A4A90485*F
    DA5A385FBA5A485FCA0*04A2092
    0D3818A5A369               :REM*140
120 DATA 1885A3A5A469 085A4EE*A
    C02ADAC02C908D0D660*A2D0A03
    1208082A250A0              :REM*245
121 DATA 342080 82A2D086FBA03B*8
    4FCA007A2142 8C80A9*078D4C3
    48DCC318DCF3B              :REM*166
122 DATA A9FC8DF4348D74328D77*3
    C6086FB84FCA004A214*208C806
    08497A9008DAD              :REM*65
123 DATA 02A497B91089A82 4C81*2
    0A782E697CEAF02D0ED*60A000B
    1A3190 08991A3             :REM*149
124 DATA C8C008D0F418A5A3690 8*8
    5A3A5A469 085A46084*97A9008
    DAD02A497B910              :REM*11
125 DATA 89A820A98118A5A36910*8
    5A3A5A469 085A4E697*CEAF02D
    0E360A98885A3              :REM*233
126 DATA A93085A4ACBF02B96789*8
    DAF02B95A89A820C382*60A9068
    DB302A9008DB0              :REM*197
127 DATA 02A9D08DB102A9228DB2*0
    2A9288DB402A9238DB5*02ACB00
    2B967898DAF02              :REM*31
128 DATA B95A89A8ADB1 285A3AD*B
    20285A4208C82ACB302*B967898
    DAF02B95A89A8              :REM*209
129 DATA ADB40285A3ADB5 285A4*2
    08C8218ADB4026940 8D*B402ADB
    50269018DB502              :REM*191
130 DATA 18ADB1026940 8DB102AD*B
    2026901 8DB202EEB302*EEB002A
    DB002C906D09D              :REM*7
131 DATA 60A000B9738999D92199*5
    93DB9788999E1219961*3DC8C00
    5D0E960A98885              :REM*219
132 DATA FBA92185FCADBF02C906*3
    01318A5FB695885FBA5*FC69008
    5FC38ADBF02E9              :REM*10
133 DATA 06A8C818A5FB6940 5FB*A
    5FC6901 85FC88D0F0A0*00B1FB4
    9FF91FBC8C058              :REM*212
134 DATA D0F560A228A000C8D0FD*C
    AD0F860A9008DAD02A9*1085A3A
    93385A4ACAD02              :REM*194
135 DATA B97D89A820A98118A5A3*6
    91885A3A5A469 085A4*EEAD02A
    DAD02C907D0DF              :REM*228
136 DATA 60A9018DB902ACBF02AD*C
    0028DB802A9008DAD02*2060 84E
    EC302ADC302C9              :REM*112
137 DATA 07D008A9008DC302EEC4*0
    2F818ADB90269018DB9*02D8EEA
    D02ADAD02CDB8              :REM*191
138 DATA 02D0D5A9008DC3028DC4*0
    260A93885A3A93485A4*ACC402C
    8A940A2012 0AB             :REM*223
139 DATA 8488D0F6ACC302C8A918*A
    2002 0AB8488D0F6ADB9*024A4A4
    A4A18693 0C930             :REM*210
140 DATA D002A920A8204C8120A7*8
    2ADB902290F18693 0A8*204C812
    0A7826 01865A3             :REM*21
141 DATA 85A38A65A485A460A918*8
    5A3A93185A4ADC1022 0*CB84ADC
    2022 0CB846 08D            :REM*57
142 DATA BA024A4A4A4A20EC84A8*2
    04C8120A782ADBA0229*0F20EC8
    4A8204C8120A7              :REM*94
143 DATA 826018693060A9008DAD*0
    2ACAD02B9908985FBC8*B9908985
    5FCC8B9908985              :REM*6
144 DATA FDC8A2028CAD02A0002 0*D
    380ADAD02C912D0DAA0*00A20CA
    9F085FBA92C85              :REM*215
145 DATA FC208C8806 0A004B9A689*9
    9702A99782A9980 2AB9*9E8999B
    82A99C02A99C8              :REM*70
146 DATA 2AB9AE8999882A99B02A*B
    9AA8999AC2B99B42B99*BC2BB9A
    28999F42B99FC              :REM*91
147 DATA 2B9942CB9B28999C42B*9
    9EC2BC8C008D0B92 F0*8460A90
    0A0009940 3FC8             :REM*106
148 DATA C040D0F8A91B8D00D0A9*3
    58D01D0A9FD8DF807A9*058D27D
    0A9018D15D0A0              :REM*110
149 DATA 00A200B9BA899D403FE8*E
    8E8C8C008D0F2602 0DF*8320688
    0C991F01AC911              :REM*27
150 DATA F022C99DF02AC91DF03A*C
    90DF007AD01DCC9EFD0*DF4C908
    638AD01D0E908              :REM*46
151 DATA 8D01D04CB08518AD01D0*6
    9088D01D04CB08538AD*00D0E90
    88D00D0AD1 0D0             :REM*251
152 DATA E9008D1 0D04CB08518AD*0
    0D0690088D00D0AD1 0D0*6900 8D1
    0D04CB085A901              :REM*6
153 DATA 8D21D0A9008D8602A912*2
    0D2FFA9202 0D2FFA992*20D2FF2
    0688 0C95FD003             :REM*30
154 DATA 4C65862 3D864C2D8648*2
    05A86A99D20D2FF6820*D2FFA91
    22 0D2FFA9202 0            :REM*249
155 DATA D2FFA9922 0D2FF60A99D*2
    0D2FFA9202 0D2FF602 0*5A86A9E
    785FBA90785FC              :REM*238
156 DATA A000B1FBC920D01138A5*F
    BE90185FBA5FCE9005*FCC903D
    0E9E6FBD002E6              :REM*145
157 DATA FC6038AD00D0E9188DBB*0
    2AD1 0D0E9008DBC02AD*BC02F00
    34CB085ADBB02              :REM*65
158 DATA C948B00 34CB085C9F890*0
    34CB08538AD01D0E932*8DBC02A
    DBC02C91 0B003             :REM*84
159 DATA 4CB085C940900 34C0587*2
    09D83A9008DAD02ADBB*02C9A09
    005A9068DAD02              :REM*96
160 DATA ADBC024A4A4AA8888898*1
    86DAD028DBF02A9 160*2090832
    00D884CB085AD              :REM*33
161 DATA BC02A240A05020EE87AD*A
    D02D013A9046 0A9188D*18D0A93
    B8D11D02 0288 0            :REM*136
162 DATA 4CB085ADBB02A270A0D0*2
    0EE87ADAD02D00 34CB0*85A000A
    9008DAD02ADBB              :REM*102
163 DATA 02D9C2899008C8EEAD02*C
    005D0F0ADAD02C902D0*0920138
    0A9008D15D060              :REM*143
164 DATA 20BE8720DF8320DF832 0*B
    E87ACAD02C004D00320*9487C00
    0D00320A987C0              :REM*52
165 DATA 01D00320A987C003D003*2
    09487A9026020 0D884C*B085F81
    8ADC202 79D189             :REM*139
166 DATA 8DC202ADC1 269008DC1*0
    2D860F838ADC202F9D1*898DC20
    2ADC102E9008D              :REM*33
167 DATA C102D860ADAD020AA8B9*C ►
```

RUN it right: **C-64; 1351 mouse optional**

```
    78985FBB9C88985FC18*A5FB694
    Ø85FDA5FC69Ø1       :REM*241
168 DATA 85FEAØØØB1FB49FF91FB*B
    1FD49FF91FDC8CØ1ØDØ*EF6Ø48A
    9ØØ8DADØ28EBD       :REM*88
169 DATA Ø28CBEØ268CDBDØ2BØØ1*6
    ØCDBEØ29ØØ16ØA9Ø18D*ADØ26Ø2
    Ø1D882ØB6842Ø       :REM*113
17Ø DATA E8822Ø2A882Ø19846ØAØ*Ø
    ØA9ØØ99883ØC8CØBØDØ*F86ØA99
    Ø85FBA93585FC       :REM*4Ø
171 DATA A9ØØ8DADØ2A5FB85A3A5*F
    C85A4A2ØØAØØØA9ØØ91*A3C8CØ1
    ØDØF918A5A369       :REM*149
172 DATA 1885A3A5A469ØØ85A4E8*E
    ØØ7DØE318A5FB694Ø85*FBA5FC6
    9Ø185FCEEADØ2       :REM*64
173 DATA ADADØ2C9Ø5DØC2A2ØØA9*D
    Ø85A3A93B85A4AØØØA9*ØØB9D68
    991A3C8CØ1ØDØ       :REM*116
174 DATA F618A5A3691885A3A5A4*6
    9ØØ85A4E8EØØ7DØEØ6Ø*A9Ø38DC
    3Ø2A9Ø08DC4Ø2       :REM*116
175 DATA A91F8DCØØ2A9ØØ8DBFØ2*A
    9198DC1Ø2A9928DC2Ø2*2ØØ38Ø2
    Ø288Ø2Ø7Ø8Ø2Ø       :REM*129
176 DATA AA8Ø2ØF18Ø2Ø2B812Ø1Ø*8
    22Ø4C822ØØ1832ØE882*2Ø83832
    Ø9D832ØEA832Ø       :REM*245
177 DATA 19842ØB6842Ø2B852Ø78*8
    54CBØ852Ø138Ø6Ø381Ø*Ø8Ø8FFØ
    81Ø3818183818       :REM*233
178 DATA 18187EØØCØ3ØØCØ3CØ3Ø*Ø
    CØ34A414E5541525946*4542525
    54152594D4152       :REM*179
179 DATA 4348415Ø52494C4D4159*4
    A554E454A554C594155*4755535
    453455Ø54454D       :REM*2Ø5
18Ø DATA 4245524F43544F424552*4
    E4F56454D4245524445*43454D4
    24552ØØØ7ØF14       :REM*4Ø
181 DATA 191C2Ø242A333A424AØ7*Ø
    8Ø5Ø5Ø3Ø4Ø4Ø6Ø9Ø7Ø8*Ø8Ø1Ø3Ø
    3Ø3Ø18ØCØCØCØ       :REM*25
182 DATA 8Ø534D54575446533229*3
    2313231323231323132*682AØ17
    82AØ19Ø2A8ØA8       :REM*161
183 DATA 2AØ1B82AØ1DØ2A8ØØØ2Ø*3
    Ø383C383Ø2ØØØØ4ØC1C*3C1CØCØ
    4ØØ1818181818       :REM*6Ø
184 DATA 1818FØEØFØ98ØCØ6Ø3Ø1*8
    Ø9ØBØCØDØ7Ø2A8Ø2A9Ø*2ABØ2AC
    Ø2A1ØØ1ØØØ11Ø       :REM*2Ø3
185 DATA ØØØØØØØØØØØØØFFØØØØ*Ø
    ØØØØØØØØFFØØFFØØFF*ØØFFØØF
    FØØFFØØFFØØFF       :REM*54
186 DATA -1             :REM*4Ø
```

Listing 2. CAL Calendar boot program. (Available on the January/February ReRUN disk.)

```
Ø REM LISTING 2 FOR CALENDAR PR
  OGRAM - JAY TAPLIN    :REM*43
1Ø CLR:DIM N(2ØØ),MA(5Ø),MD(12)
   ,MO$(12),NO(12):FORJ=1TO12:R
   EADMD(J),NO(J):NEXT :REM*153
2Ø DATA1,31,32,28,6Ø,31,91,3Ø,1
   21,31,152,3Ø,182,31,213,31,2
   44,3Ø,274,31         :REM*76
3Ø DATA3Ø5,3Ø,335,31    :REM*154
4Ø SN(1)=34556:SN(2)=347Ø2:Z=7Ø
   5:D=28:Y=174:M=12:POKE5328Ø,
   1                    :REM*75
5Ø IFPEEK(32768)<>76THENGOSUB41
   Ø:LOAD"CALENDAR.ML",8,1
                        :REM*55
6Ø SYS32768             :REM*21
7Ø IFPEEK(78Ø)=ØTHENEND :REM*92
8Ø IFPEEK(78Ø)=4THENGOTO33Ø
                        :REM*8Ø
9Ø RV=SN(PEEK(78Ø)):GOSUB11Ø
                        :REM*35
1ØØ SYSRV:GOTO7Ø        :REM*223
11Ø M=PEEK(7Ø3)+1:Y=(((PEEK(Z)A
   ND24Ø)/16)*1ØØØ)+((PEEK(Z)A
   ND15)*1ØØ)           :REM*134
12Ø Y=Y+(((PEEK(Z+1)AND24Ø)/16)
   *1Ø)+(PEEK(Z+1)AND15)
                        :REM*223
13Ø OT=NO(M):SD=((((Y)*365)+INT
   ((Y)/4)+MD(M)))-((Y)*364)+3
                        :REM*129
14Ø IF Y=1752 AND M=1 THEN OT=O
   T-11:SD=SD+11        :REM*86
15Ø IF Y>1751 THEN SD=SD-11
                        :REM*85
16Ø IF (Y-(INT(Y/1ØØ)*1ØØ))=Ø A
   ND Y>1752 AND M=2 THEN OT=O
   T-1                  :REM*181
17Ø IF (Y-(INT(Y/1ØØ)*1ØØ))=Ø A
   ND(Y/4ØØ)=INT(Y/4ØØ)ANDY>17
   52ANDM=2THEN OT=OT+1
                        :REM*193
18Ø IF((Y)/4)=INT((Y)/4)ANDM<3T
   HENSD=SD-1           :REM*2Ø5
19Ø IF((Y)/4)=INT((Y)/4)ANDM=2T
   HENOT=OT+1           :REM*6Ø
2ØØ VD=SD-((INT(SD/7))*7):IFVD=
   ØTHENVD=7            :REM*243
21Ø POKE7Ø8,Ø:POKE7Ø7,VD-1:POKE
   7Ø4,OT:RETURN        :REM*1Ø
22Ø GOSUB23Ø:GOSUB41Ø:GOSUB26Ø:
   SYS34324:GOSUB41Ø:GOSUB24Ø:
   SYS34583:GOTO7Ø      :REM*147
23Ø FI$=MID$(STR$(M),2)+"-"+MID
   $(STR$(D),2)+"-"+MID$(STR$(
   Y),2):N=32:RETURN    :REM*129
24Ø GOSUB31Ø:OPEN15,8,15,"S0:"+
   FI$:CLOSE15:SYS57812FI$,8:P
   OKE173,4:POKE172,Ø   :REM*198
25Ø POKE78Ø,172:POKE781,EAND255
   :POKE782,E/256:SYS65496:RET
   URN                  :REM*11
26Ø OPEN2,8,2,FI$:CLOSE2:OPEN15
   ,8,15:INPUT#15,A:CLOSE15:IF
   A=62THENRETURN       :REM*194
27Ø SI$=FI$+",P,R":OPEN1,8,1,SI
   $:POKE185,Ø:POKE78Ø,Ø:POKE7
   81,Ø:POKE782,4       :REM*71
28Ø SYS65493:CLOSE1:SYS34408:GO
   SUB29Ø:RETURN        :REM*88
29Ø GOSUB31Ø:J=E-1Ø24:Y=INT(J/4
   Ø):X=J-Y*4Ø:POKE163,24:POKE
   164,96:SYS163        :REM*1Ø7
3ØØ POKE781,Y:POKE782,X:SYS6552
   Ø:PRINT;:RETURN      :REM*21Ø
31Ø E=PEEK(252)*256+PEEK(251):R
   ETURN                :REM*18
32Ø OPEN15,8,15,"S0:12-28-1974"
   :CLOSE15             :REM*18
33Ø POKE53272,21:POKE53265,27:P
   OKE646,Ø:POKE5328Ø,1:POKE53
   281,1:PRINT"{SHFT CLR}"
                        :REM*47
34Ø X=PEEK(53248)-24+PEEK(53264
   )*256:VX=X:IFX<8ØORX>24ØTHE
   NSYS34583:GOTO7Ø     :REM*1Ø8
35Ø Y=PEEK(53249)-5Ø:VY=Y:IFY<1
   36ORY>184THENSYS34583:GOTO7
   Ø                    :REM*88
36Ø IFLEFT$(MID$(STR$(((X-8Ø)/3
   )-(INT((X-8Ø)/3))),3),1)="3
   "THENSYS34583:GOTO7Ø
                        :REM*222
37Ø GOSUB11Ø:FORJ=ØTO5Ø:MA(J)=Ø
   :NEXT:FORJ=VDTOVD+OT-1:MA(J
   )=J-VD+1:NEXT        :REM*93
38Ø X=INT((VX-8Ø)/24):VY=INT((V
   Y-136)/8):VA=VY*7+X+1:D=MA(
   VA)                  :REM*231
39Ø IFD=ØTHENSYS34583:GOTO7Ø
                        :REM*13
4ØØ GOTO22Ø             :REM*2Ø8
41Ø OPEN2,8,2, "$":CLOSE2:OPEN1
   5,8,15:INPUT#15,E:CLOSE15:I
   FE<21THEN RETURN     :REM*7Ø
42Ø FORQ=1Ø24 TO 1143:N(Q-1Ø24)
   =PEEK(Q):POKEQ,42:NEXT:PRIN
   TCHR$(19)CHR$(17);   :REM*51
43Ø PRINTSPC(4Ø)+CHR$(145)+"*{8
    SPACEs}DISK ERROR - CHECK
   DISK{7 SPACEs}*";    :REM*5
44Ø GOSUB46Ø:FORJ=1Ø24 TO 1143:
   POKEJ,N(J-1Ø24):NEXT:GOTO41
   Ø                    :REM*245
45Ø END:GOTO22Ø         :REM*52
46Ø GETA$:IFA$=""THEN46Ø:RETURN
                        :REM*255
47Ø RETURN              :REM*1Ø2
```

Listing 3. Mouse driver program. (Available on the January/February ReRUN disk.)

```
Ø REM COMMODORE 1351 MOUSE DRIV
  ER - RUN ONCE BEFORE RUNNING
  CALENDAR PRG.         :REM*87
1Ø DIMV(1ØØ):FORJ=ØTO9:V(J+48)=
   J:V(J+65)=J+1Ø:NEXT:J=494Ø7
                        :REM*83
2Ø J=J+1:READA$:IFA$="-1"THENSY
   S494Ø8:END           :REM*162
3Ø Z=V(ASC(LEFT$(A$,1)))*16+V(A
   SC(RIGHT$(A$,1))):POKEJ,Z:GO
   TO2Ø                 :REM*27
4Ø DATA AD,15,Ø3,C9,C1,FØ,19,Ø8
   ,78,AD,14,Ø3,8D,ØØ,CØ,AD,15,
   Ø3,8D,Ø1,CØ,A9,21,8D :REM*88
5Ø DATA 14,Ø3,A9,C1,8D,15,Ø3,28
   ,6Ø,D8,AD,19,D4,AC,Ø2,CØ,2Ø,
   58,C1,8C,Ø2,CØ,18,6D :REM*24
6Ø DATA ØØ,DØ,8D,ØØ,DØ,8A,69,ØØ
   ,29,Ø1,4D,1Ø,DØ,8D,1Ø,DØ,AD,
   1A,D4,AC,Ø3,CØ,2Ø,58:REM*162
7Ø DATA C1,8C,Ø3,CØ,38,49,FF,6D
   ,Ø1,DØ,8D,Ø1,DØ,6C,ØØ,CØ,8C,
   Ø5,CØ,8D,Ø4,CØ,A2,ØØ:REM*221
8Ø DATA 38,ED,Ø5,CØ,29,7F,C9,4Ø
   ,BØ,Ø7,4A,FØ,12,AC,Ø4,CØ,6Ø,
   Ø9,CØ,C9,FF,FØ,Ø8,38:REM*113
9Ø DATA 6A,A2,FF,AC,Ø4,CØ,6Ø,A9
   ,ØØ,6Ø,-1            :REM*244
```

■

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Hip Hop

This electrifying game may become your "current" favorite.

By TONY BRANTNER

Life's not easy for Hoppin' Clyde. He used to really enjoy hopping around an electronic grid, lighting up the tiles as he went. But now a short circuit in the wiring sends raw electricity pulsing across the grid, and has turned this once harmless form of entertainment into a real shocker. Keep Clyde off the flashing tiles, or *ZAP!* He's toast.

Clyde starts each game at a random spot on the grid. You simply move the joystick to make him jump from tile to tile in any of the four primary directions. When he lands on a dark tile, it lights up and you earn ten points multiplied by the present game level. Backtracking over a tile turns it off again, and your score is reduced by the same amount. You have to light all of the tiles to advance to the next level.

Watch out, though, because the deadly current pulses back and forth along each row of the grid, pausing only briefly at the end of the row before moving back again. Clyde can avoid the electric tiles by either jumping away from them or jumping over them. Jumping over the hot tiles takes precise timing, so be careful.

At the start of each game Clyde has three lives, and the timer counts down from 100. With each succeeding level, he gets an extra life and the timer loses two seconds. Clyde loses a life each time he gets zapped or the timer runs out.

Press the SHIFT-LOCK key to pause the game and the RUN-STOP key to resume it. The colorful screen always shows Clyde's current life, the timer, your current score and your high score for the session.

Type in Hip Hop from Listing 1, using *RUN*'s Checksum program on page 57 to catch any typing errors. Then, the next time you're feeling bouncy—or need a good jolt—load up, and Hip Hop to victory! R

Tony Brantner is plugged in as RUN's *most prolific game writer of all time.*

Listing 1. Hip Hop program. (Available on the January/February ReRUN disk. To order, call 800-343-0728.)

```
0 REM THIS LIST 1 CREATES (AND
  SHOULD NOT BE CALLED) HIPHOP.
  ML                    :REM*111
5 OPEN 8,8,8,"HIPHOP.ML,P,W"
                        :REM*172
6 CT=0:PRINT"{SHFT CLR}":REM*56
10 READ A$:IF A$="-1" THEN CLOS
   E8:PRINT:PRINT"ALL DONE!":EN
   D                    :REM*129
12 PRINT"{HOME}READING LINE "+S
   TR$(CT):CT=CT+1      :REM*141
15 IF LEN(A$)<62 THEN 55
                        :REM*254
20 B$=MID$(A$,1,20)+MID$(A$,22,
   20)+MID$(A$,43,20)   :REM*242
25 FOR I=1 TO 30        :REM*181
30 C$=MID$(B$,(I*2)-1,2):H$=LEF
   T$(C$,1):L$=RIGHT$(C$,1)
                        :REM*209
35 H=VAL(H$):IF H$>"9" THEN H=A
   SC(H$)-55            :REM*85
40 L=VAL(L$):IF L$>"9" THEN L=A
   SC(L$)-55            :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);
                        :REM*67
50 NEXT:GOTO 10         :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOT
   O 70                 :REM*184
60 IF LEN(A$)<42 THEN B$=LEFT$(
   A$,20)+RIGHT$(A$,(LEN(A$)-21
   )):GOTO 70           :REM*176
65 B$=LEFT$(A$,20)+MID$(A$,22,2
   0)+RIGHT$(A$,LEN(A$)-42)
                        :REM*140
70 FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEF
   T$(C$,1):L$=RIGHT$(C$,1)
                        :REM*140
80 H=VAL(H$):IF H$>"9" THEN H=A
   SC(H$)-55            :REM*56
85 L=VAL(L$):IF L$>"9" THEN L=A
   SC(L$)-55            :REM*84
90 BY=H*16+L:PRINT#8,CHR$(BY);
                        :REM*148
95 NEXT:GOTO 10         :REM*160
100 REM HEX DATA FOR HIP-HOP
                        :REM*88
101 DATA 0108080808A009E323036*3
    1000000A90C8D20D0A9*0F8D21D
    0A95BA00E201E       :REM*201
102 DATA ABA027A945991805A90C*9
    918D9881 0F3A9018D25*D08D1CD
    0A007A9019927       :REM*144
103 DATA D0A9FD99F80788D0F3A9*0
    38D27D0A9008D17D08D*1BD08D1
    DD08D26D0A901       :REM*165
104 DATA 8505201DB0BA003203C30C*A
    9008D0D1020050DA900*A899 0F1
    0C8D0FAA000B9       :REM*254
105 DATA 4E0F9940 3FC8C0BF90F5*2
    06D0CAD1BD429011869*038D271
    0AD1BD429068D       :REM*9
106 DATA 2F10A2002063 0B20DC0A*A
    5052 0D00C8CFC048DFD*04A505 0
    A8501238A966E5      :REM*104
107 DATA 028D0E1020B30C20900C*A
    91DA00F2044 0B20B00A*203609BA
    D00DC2 90FC90F      :REM*73
108 DATA F0EAA2082 0FFE9202E1FF*D
    0034C5708AD8D02C901*F0F9E60
    3A503291FD003       :REM*122
109 DATA 20B00C2036 0B2 0000B20*B
    00A20A6092090 0CA212*A000C8D
    0FDCAD0FAAD3F       :REM*153
110 DATA 10D0052 0C30AB02FAD0D*1
    0C938F008AD0E10F023*4CD808A
    2FFA90D2016 0C      :REM*150
111 DATA A406C8C064B0032 0C30C*A
    405C8C010B002842052 0*E90C4C6
    3082 06D0CA906      :REM*140
112 DATA 8D03D4A90C8D05D4A941*8
    D04D4A03FA200A900 9D*803F9DC
    03F9848A9022 0      :REM*227
113 DATA 880C2036 0B68A88A1869*0
    B293FAA8E01D4881 0DF*A236A90
    E2016 0CA40688      :REM*57
114 DATA 20C30CA506F00034C6B08*A
    935A00F2044 0B2036 0B*AD00DC2
    91 0D0EF20E90C      :REM*224
115 DATA 4C5708AC3F10D035A203*A
    D00DC29 0FDDEB0DF004*CA10F86
    08E371018AD2F       :REM*60
116 DATA 107DEF0DC907B0F1A818*A
    D27107DF30DC908B0E5*8C2F108
    D27102 0FD0BA0      :REM*47
117 DATA 00A9FFC0049006C014B0*0
```

RUN it right: **C-64; joystick in port 2**

Keep Clyde hopping from tile to tile to avoid getting zapped by the deadly current.

```
    2A9FE8DF8Ø7AE371ØFØ*Ø9CAFØØ
    9CAFØ144CØ3ØA        :REM*238
118 DATA 4C6BØA4C8AØAEE171ØDØ*1
    1EE1F1Ø4C19ØAAD171Ø*DØØ3CE1
    F1ØCE171Ø18AD        :REM*162
119 DATA ØF1Ø79CFØD8DØF1ØC8CØ*1
    89Ø3F2ØC3ØABØ382Ø5C*ØDA5Ø52
    9Ø3AAAØØØB1FD        :REM*158
12Ø DATA 29ØFDDF7ØDDØ14BDFBØD*2
    Ø43ØDEEØD1ØA6Ø52ØA6*ØB2ØE9Ø
    B4C65ØABDF7ØD        :REM*159
121 DATA 2Ø43ØDCEØD1ØA6Ø52Ø8E*Ø
    B2ØE6ØBAØØØ8C3F1Ø6Ø*18ADØF1
    Ø799FØD8DØF1Ø        :REM*127
122 DATA 18AD171Ø79B7ØD8D171Ø*A
    D1F1Ø69ØØ8D1F1Ø4C23*ØA38A91
    7ED3F1ØAA38AD        :REM*3
123 DATA ØF1ØFD9FØD8DØF1Ø38AD*1
    71ØFDB7ØD8D171ØAD1F*1ØE9ØØ8
    D1F1Ø4C23ØAAD        :REM*25
124 DATA 3F1ØDØØDA5A24A4A4A4A*2
    9Ø1Ø9FE8DF8Ø76ØAØØ7*B9271ØC
    D271ØDØØ8B92F        :REM*156
125 DATA 1ØCD2F1ØFØØ588DØED18*6
    Ø386ØA2Ø78A38E9Ø19D*2F1ØAD1
    BD429Ø3A8B9E7        :REM*66
126 DATA ØD9D271ØAD1BD429Ø19D*3
    71Ø2Ø63ØBCADØDF6ØEE*4Ø1ØAD4
    Ø1ØC928BØØ16Ø        :REM*91
127 DATA A5Ø5ØA8D4Ø1ØA2Ø7BC37*1
    Ø18BD271Ø79F5ØDC9Ø8*BØØ69D2
    71Ø4C2FØBAD1B        :REM*221
128 DATA D429Ø19D371Ø2Ø63ØBCA*D
    ØDE6ØAØ55A5A229Ø4DØ*Ø2AØAB8
    C15DØ6Ø85A784        :REM*232
129 DATA A8A5A24A4A4A4A4A29Ø1*8
    D86Ø2A2Ø8AØØ8182ØFØ*FFA5A7A
    4A84C1EABBD27        :REM*126
13Ø DATA 1ØØAØAØA85Ø2ØA1865Ø2*B
    C2F1Ø187998ØD9D171Ø*A9ØØ69Ø
    Ø9D1F1ØBD2F1Ø        :REM*3Ø
131 DATA ØAØAØAØA18697D9DØF1Ø*6
    ØAØØ418B9A8Ø4E9ØØC9*3ØBØØ2A
    93999A8Ø4881Ø        :REM*79
132 DATA EFCADØE96ØAØØ438B9A8*Ø
    469ØØC93A9ØØ2A93Ø99*A8Ø4881
    ØEFCADØE9AØØØ        :REM*99
133 DATA B9A8Ø4D9CØØ49Ø13DØØ6*C
    8CØØ69ØF16ØAØØ5B9A8*Ø499CØØ
    4881ØF76ØAØØ5        :REM*153
134 DATA A93Ø99A8Ø4881ØFA6ØA9*1
    Ø2CA91C8DØ1D4A9298D*Ø5D4A22
    Ø8EØ4D4E88EØ4        :REM*84
135 DATA D46ØA9Ø38DØ8D4A9958D*Ø
    AD4A9Ø98DØCD4A24Ø8E*ØBD4E88
    EØBD46Ø86A785        :REM*243
136 DATA A82Ø6DØCA9Ø88DØ3D4A9*3
    Ø8DØ5D4A9E48DØ6D4A9*ØØ85Ø4A
    5Ø4ØA1865Ø4A8        :REM*85
137 DATA B1A7FØ328D411ØA24Ø8E*Ø
    4D4C8B1A7FØØF48C8B1*A78DØØD
    4688DØ1D4E88E        :REM*33
138 DATA Ø4D42ØBØØA2Ø36ØBA5A2*C
    5A2FØFCCE411ØDØEFE6*Ø44C3ØØ
    CAØ17A9ØØ99ØØ       :REM*187
139 DATA D4881ØFA8CØED48CØFD4*A
    98Ø8D12D4A98F8D18D4*6Ø1865A
    2C5A2DØFC6ØA2        :REM*66
14Ø DATA Ø78AØAA8BDØF1Ø99Ø1DØ*B
    D171Ø99ØØDØBD1F1Ø4A*26Ø2CA1
    ØE8A5Ø28D1ØDØ        :REM*23Ø
141 DATA 6ØCEØE1ØADØE1Ø2ØDØØC*8
    EDEØ48CDFØ48DE ØØ46Ø*84Ø6982
    ØDØØC8C11Ø58D        :REM*199
142 DATA 12Ø56ØA23ØAØ3ØC9649Ø*Ø
    5E964E8DØF7C9ØA9ØØ5*E9ØAC8D
    ØF7Ø93Ø6ØA9ØØ        :REM*222
143 DATA 8D15DØA9Ø885Ø4A6Ø42Ø*F
    FE9A9Ø32Ø88ØCE6Ø4A5*Ø4C9199
    ØEE6ØA9Ø68D2F        :REM*219
144 DATA 1ØA9Ø78D271ØA5Ø529Ø3*A
    8B9F7ØD2Ø43ØDAØØØA9*E991FBC
    8A9AØ91FBC8A9        :REM*15
145 DATA 6991FBAØ28A97791FBC8*9
    1FBCE271Ø1ØD7A9Ø32Ø*88ØCCE2
    F1Ø1ØC86Ø482Ø        :REM*123
146 DATA 5CØD68AØØØ91FDC891FD*C
    891FDAØ28A9ØB91FDC8*91FD6ØA
    C2F1Ø18A9C679        :REM*157
147 DATA 8AØD85FBA9Ø57991ØD85*F
    CAD271ØØA186D271Ø18*65FB85F
    B85FDA5FC69ØØ        :REM*144
148 DATA 85FC29Ø3Ø9D885FE6ØØØ*4
    E9CEA3886D4ØØØØØØØØ*Ø1Ø1Ø18
    8786858483828        :REM*174
149 DATA FCFCFCFDFDFDFEFEFEFF*Ø
    ØØØØØØØØØØØØØ1Ø1Ø1*Ø2Ø2Ø2Ø
    3ØØØØØØØØ1Ø1         :REM*164
15Ø DATA Ø1Ø1Ø1Ø1Ø1Ø1Ø1Ø1Ø1Ø1*Ø
    1Ø1Ø1Ø1ØØØØØØØFDFD*FEFEFEF
    FFFFFØØØØØØØ         :REM*18Ø
151 DATA ØØØØØØØØ1Ø1Ø1Ø2Ø2Ø2*Ø
    3Ø3ØØØ1Ø6Ø7ØEØDØBØ7*FFØ1ØØØ
    ØØØØFFØ1Ø8Ø6         :REM*242
152 DATA Ø2Ø5Ø7ØEØAØDØF386ØØC*3
    22ØØC2CCØ1E386ØØF32*2ØØC386
    ØØA322ØØF2CCØ        :REM*168
153 DATA 1E386ØØF322ØØA386ØØF*3
    22ØØF2CCØØA386ØØF32*2ØØF2CC
    ØØ4ØØØ5Ø2CCØ         :REM*195
154 DATA ØØ121C3ØØC191Ø181C3Ø*Ø
    C191ØØA166ØØA166ØØC*191ØØA1
    C3ØØA191ØØA16        :REM*2Ø2
155 DATA 6ØØ3ØØØØA166ØØØØ88E*9
    3ØD2Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø*81BC122
    Ø92AF122Ø92BE        :REM*133
156 DATA 12BBAC92BC122ØC62Ø92*2
    ØBC122Ø92AF122Ø92BE*122ØA22
    Ø92BC122ØC62Ø        :REM*1Ø4
157 DATA ØD2Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø1C*A
    C122Ø92B7122Ø92BB12*BEBC92A
    C122Ø92B7B72Ø        :REM*46
158 DATA AC122Ø92B7122Ø92BB12*2
    Ø92A2122Ø92AC122Ø92*B7B7ØD1
    12Ø2Ø1F53434F        :REM*27
159 DATA 52452Ø53Ø3Ø3Ø3Ø3Ø3Ø*2
    Ø2Ø119554494D4552Ø*Ø5313Ø3
    Ø912Ø2Ø9C4849        :REM*129
16Ø DATA 4748ØØ53Ø3Ø3Ø3Ø3Ø3Ø*Ø
    D112Ø2Ø2Ø2Ø2Ø2Ø814C*4556454
    C2ØØ53Ø312Ø2Ø        :REM*4
161 DATA 2Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø2Ø*2
    Ø9A4C4956455532ØØ53Ø*34ØØ2Ø4
    D4F5645Ø4A4F         :REM*138
162 DATA 59535449434B2Ø544F2Ø*4
    24547494EØ5Ø524553*532Ø464
    952452Ø544F2Ø        :REM*127
163 DATA 5Ø4C41592Ø414741494E*Ø
    ØØØØØØØØØØØØØØØØØØØ*ØØØØØØØ
    ØØØØØØØØØØØ         :REM*19Ø
164 DATA ØØØØØØØØØØØØØØØØØØØ*Ø
    ØØØØØØØØØØØØØØØØØØØ*Ø1FFFFØ
    38ØØE07ØØ1CØE        :REM*183
165 DATA ØØ381CØØ7Ø38ØØE07ØØ1*C
    ØFFFF8Ø26ØCØØ3Ø33ØØ*CC7ØFFØ
    DØ3AACØØEEBBØ        :REM*219
166 DATA ØEEBBØØE69BØØ3AACØØ3*E
    BCØØ33CCØØ3ØØCØØ3ØØ*CØØ3ØØC
    ØØ3ØØCØØDC37Ø        :REM*81
167 DATA 35C35CD7ØØD73CØØ3CØØ*Ø
    ØØØØØØØØØØØØØE6ØC*ØØ3Ø34Ø
    Ø1CØCØØ3ØØCØØ        :REM*181
168 DATA 3ØØ3ØØCØØFFØØØ3AACØ*Ø
    EAABØØEEBBØØEAABØ3F*AAFCFØE
    BØF3C3C3CØFØØ        :REM*114
169 DATA FØØDC37Ø35C35CD7ØØD7*3
    CØØ3CØØØØØØØØØØØ*ØØØØØØØ
    ØØØØØØØØØØØ         :REM*81
17Ø DATA ØØØØØØØØØØØØØØØØØØØ*Ø
    ØØØØØØØØØØØØØØØØØØØ*ØØØØØØØ
    ØØØØØØØØØØ          :REM*14
171 DATA ØØØØØØØØØØØØØØØØØØØ*Ø
    ØØØØØØØØ             :REM*25
172 DATA -1              :REM*3Ø ■
```

RUN it right: **C-64; joystick in port 2**

Perfect Companions

It's a match made in computing heaven: your Commodore and one of these high-quality dot-matrix printers from Panasonic.

By TIM WALSH

Printers are the great equalizers of computing, because you can't always tell if the computer used to make a printed page was a $150 Commodore or a $25,000 Sun workstation. At the *RUN* editorial offices we appreciate this fact, because, while we have more expensive computers on our desks, we also rely on our 128Ds for getting the words we want to our readers. We know a good printer can make all the difference in the world.

With Panasonic's introduction of two new 24-pin printers, Commodore owners can generate some of the best characters and graphics possible from any dot-matrix machine. And, thanks to the attractive—if not "clearinghouse"—prices Panasonic has assigned them, they offer an excellent choice even for those Commodore owners on a limited budget.

We'll take a look at both printers and let you decide if they deliver all the goods you want and need. Let's kick things off with an overview of the more conservative and budget-minded of the two, the KX-P1123.

Panasonic KX-P1123

If you're a Commodore user who wants a 24-pin printer and you're not anxious to spend a lot of money, you'd do well to take a serious look at the versatile KX-P1123. Its long list of print features is really only half the story; its greatest strength lies in its ability to produce some of the darkest, finely detailed characters and graphics seen on any dot-matrix printer.

Unpacking the printer and getting it connected to your Commodore is a snap. Remove the packing, pop the ribbon cartridge in, thread the paper through, and you're almost ready to go. The last step is to plug in a Commodore-compatible printer interface, such as my personal favorite, the Xetec Super Graphix.

When it comes to paper handling, the 1123 has a few tricks up its sleeve. If you're using continuous forms or labels, you can direct them either through the rear of the printer or the bottom feed beneath. Two levers let you control paper-feed selection, paper-bail release, paper parking and head gap. By having the levers on top and easy to access, the 1123 is remarkably label- and envelope-friendly. All too often I classify printing envelopes a challenge at best, but I found the 1123 handles them as easily as continuous-form paper.

Emulation Station

The 1123 has two emulation modes: Epson LQ-850 and IBM Proprinter X24. The Epson emulation surely ranks as the more important of the two, since many Commodore software packages that support bit-mapped graphics also offer Epson printer drivers. Because the 1123 defaults to Epson mode, you just select an Epson printer driver from your software and set your printer interface to either Transparent or Semi-transparent mode. After that, you needn't give it another thought.

Of course, if you're using a non-graphics program, such as the RUN Script word processor, you can still benefit from the Epson mode. I used Epson-specific commands sent through the software to change printer fonts and provide text enhancements such as bold, italics and underlining.

The Operating Instructions booklet that accompanies the printer is packed with commands for selecting print options. Since the printer lacks Commodore-code compatibility, you have to learn to decipher the instructions and convert them to a language that your Commodore can understand.

This process isn't nearly as complicated as it sounds. Although I've explained it in previous printer reviews, the conversion process bears repeating for new readers. For demonstration purposes, on page 6–13 of the manual you'll find the Name, Decimal and Hexadecimal commands needed to turn italic printing on and off.

For the Commodore 64 and 128, you need only concern yourself with the decimal commands. Since the manual states that 27,52 turns on italics and 27,53 turns it off, you would enter the following command from Basic to turn on the italics mode:

```
OPEN 4,4,7 PRINT#4,CHR$(27);
 CHR$(52) CLOSE 4
```

To turn off italics, just substitute a 53 for the 52 in the above command. When using software packages such as databases and word processors, the process is actually easier, because then you send commands such as 27,52 directly to the printer.

Fast Company

In performance and features, the 1123 won't disappoint even the most discerning customer. In the speed department, it prints up to 240 characters per second in Micron Draft mode, and slows to 63 cps when using the Letter Quality mode with Elite characters. Overall, the 1123 is plenty fast for most home and small business demands.

It has five basic character-per-inch settings: Pica (10 cpi), Elite, Micron, Compressed and Elite Compressed. All of these settings are also available in elongated mode, resulting in a total of ten basic character settings. Fonts offered by the 1123 include Program, Draft, Courier, Prestige, Bold PS and Script.

When it's operating in the default Ep-

The KX-P1123 would be hard to beat in its price range. It gives high-quality output and is an excellent choice for the upgrade-minded.

The KX-P1124i produces near-laser-quality output. It's more money, but has many more features, including a selection display window.

son mode, the printer has six print densities in 8-pin mode, ranging from a standard of 60 dots per inch to a remarkably dark 360 dpi. In 24-pin mode, it has five print densities, again ranging from 60 to 360 dpi.

At a glance, the 1123 appears to have one of the most complex control panels found on any consumer printer: No fewer than twelve LED lights and five function buttons adorn the front panel. Some of these, such as the Quiet button, are straightforward in their meaning. Other options, however, require deciphering a matrix of lines and lights.

While some newcomers might be slightly befuddled by this initially, don't let the sight fool you—this printer is actually quite simple to use in its day-to-day operation. Owners of other Panasonic printers with a similar panel, such as the KX-P1080, can testify to this. And, as I mentioned before, there is an alternative that will allow you to bypass the control panel: You can send commands to the printer via software or through Direct mode on your Commodore.

In summary, it's tough to be objective when reviewing a printer as good as the 1123. There's a lot to rave about, not the least of which being the features you get for the price. Perhaps one of the most compelling reasons for buying the 1123 isn't the price, though; rather, it's that should you get a laptop or more powerful PC in the future, this printer would make it a perfect companion also, even if you bought one of the most powerful computers out there.

Panasonic KX-P1124i

One of the best-selling printers of all time was Panasonic's KX-P1124, introduced several years ago to rave reviews. The KX-P1124i is an improved version of that wildly successful printer. As good as the 1123 is, the 1124i is better.

Bigger Price=Better Options

If it's options you're after and you're willing to spend a little more, the option-laden 24-pin 1124i simply has more features than any other dot-matrix printer you'll find anywhere at any price. Even the 1123 is no match for the 1124i. It has a fast print speed (300 cps draft/80 cps LQ), 360 × 360 dpi graphics resolution, a more sophisticated paper-handling system and a display window for sending and monitoring printer commands.

Setting up and connecting this printer to your Commodore differs little from the 1123. And, if the 1123's control panel seems complex, the 1124i's panel looks, and is, simple. Its panel has two more function buttons, for a total of seven, but it offers something rarely seen outside of laser printers—the previously-mentioned display window that explains all user-selectable settings.

As with the 1123, you can send commands to the 1124i through either the control panel or software. Even to the user well-versed in deciphering the 1123's matrix of lines and LED lights, the 1124i's display window is a welcome relief for quickly selecting print options. You just press the Function Enter/Exit button, the Menu button, the Item button, then the Selection button. When you have the proper setting in the display window, you press the Set button to set it. All of the buttons are multifunctional, with the Set button doubling as the Online/Offline button, the Selection button doubling as the Load/Park button, and so on.

Upwardly Mobile Printer

When it comes to paper handling, the 1124i is in a class by itself. It'll do everything that the 1123 does, only more easily and conveniently. Need to print on stationery or envelopes? Just pop open the front of the printer, park the continuous form-feed paper and put the envelopes in the front opening. Need to print labels? Just feed them into one of the two tractor feeds and you're ready.

What do I like most about this printer? The fine print quality notwithstanding, perhaps it's the printer's remarkable mechanical quality. And the statement I made concerning the 1123's high potential for "upward mobility" can be made with even greater emphasis regarding the 1124i. This printer will stand up to your requirements, no matter what platform you might later use it with.

The 1124i provides some benefits not mentioned in the manual. With lower operating costs than any laser printer, it is an excellent alternative to going that route. And with a character resolution of 48 dots tall by 30 dots wide, its text approaches laser quality. With its fast speed and long ribbon life, it would make a great addition to any busy small business office.

Unfortunately, this model probably won't attract many followers among Commodore users; its price is just a bit too high. But, if you demand only the best for your Commodore, you needn't look any further. ■

Among other things, Tim Walsh is RUN's *hardware hard guy. He writes for* RUN *and its sister publication,* AmigaWorld.

Panasonic
Two Panasonic Way
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KX-P1123 Printer, $399.95
KX-P1124i Printer, $499.95

File Packer 64

When you're sending or storing files, this program will pack them efficiently and keep them safe.

By STEVE EMSLEY

One of the disadvantages of ordinary file compression programs is that they create one big file, which you must load and run to uncompress. Not File Packer 64—it's not just another ordinary file compression program.

File Packer 64 not only lets you shorten and combine disk files, but it also lets you compress individual files, or any combination of files. In addition, it lets you encode each compressed file with a different byte, or code, for protection from unauthorized decompressing.

Loading Instructions

Type in Listing 1, File Packer 64, and save it to disk. Then, type in and save Listing 2. Use the Checksum program on page 57 to catch any typing errors you might make. Run Listing 2 to create Packer.ML, the machine language file that is loaded by File Packer.

Next, type in and save Listing 3, which is an unpacking routine used to write files to disk as File A, File B, and so on. Finally, type in and save Listing 4, then run it to create Unpacker.ML, the machine language file used by Listing 3.

The Menu

File Packer's menu offers four options: Save Unpacker, Pack File(s), Append File(s) and End.

Option 1 saves to disk a file called Unpacker. When selected, it asks for a memory location. Try to choose a location that isn't needed for other things. Locations 32768 and 49152 seem to work best.

After entering the memory location, place a disk in the destination drive and press any key to initiate the save. The routine is saved as a 1-block file.

Option 2 compacts the individual files. Enter the current filename and the new filename at this point. Pressing RETURN without an entry for either prompt aborts to the menu. Be certain that you enter the Basic program files first, since the program won't work if the last file packed into a compressed file is a Basic program.

Next, enter a number from 0 to 255 as an XOR byte. File Packer encrypts the file (including the load address) by exclusive "ORing" with this number. A blank here leaves the file unencoded.

Because the encoding byte is stored in the file and not the unpacking routine, each file can have a different encoding number. The files are secure from tampering because they must then be loaded with the unpacking routine.

After the file is found, File Packer displays the original load address for you to change or keep. Pressing the LEFT-ARROW key at this point aborts to the menu (as will a disk error).

Depending on the size of the file, the encoding and crunching takes from one to several minutes. When it's done, you'll have a chance to compact another file. Unlike other file compactors that require loading three or four files, then compressing them, File Packer requires loading just one. Also, because the load address of each file is separate, the files can be packed in any order.

Option 3 is for adding, or appending, a file to an existing packed file. It asks for the name of the file to be added and the name of the packed file.

Option 4 quits the program.

Special Keys

File Packer defines the following keys to serve special functions:

S changes the source device, should you want to use a second drive. Drives 8–11 are supported.

F1 and **F3** toggle the source (read) and destination (write) drives.

F5 and **F7** display directories of the source and destination disks, respectively.

These special keys are listed on the same screen as the menu.

Loading Files

You have two choices for unpacking any of the compacted files. First, you can use the Unpacker routine created by Listing 1, which unpacks the files only in the computer's RAM. Use the statement LOAD"UNPACKER",8,1 to load the unpacking file. To load a compacted file from Basic, use:

```
OPEN 8,D,2,"0:FILENAME":SYS
  LOCATION
```

where D is the device number (usually 8), and LOCATION is the location of the unpacker routine.

The screen border flickers to let you know when the file is loading and stops when it's done. The packed files then reside in memory at the locations specified when packed.

The second, and easier, way to use the program is to run Listing 3, then enter the name of the packed file at the ►

RUN it right: **C-64**

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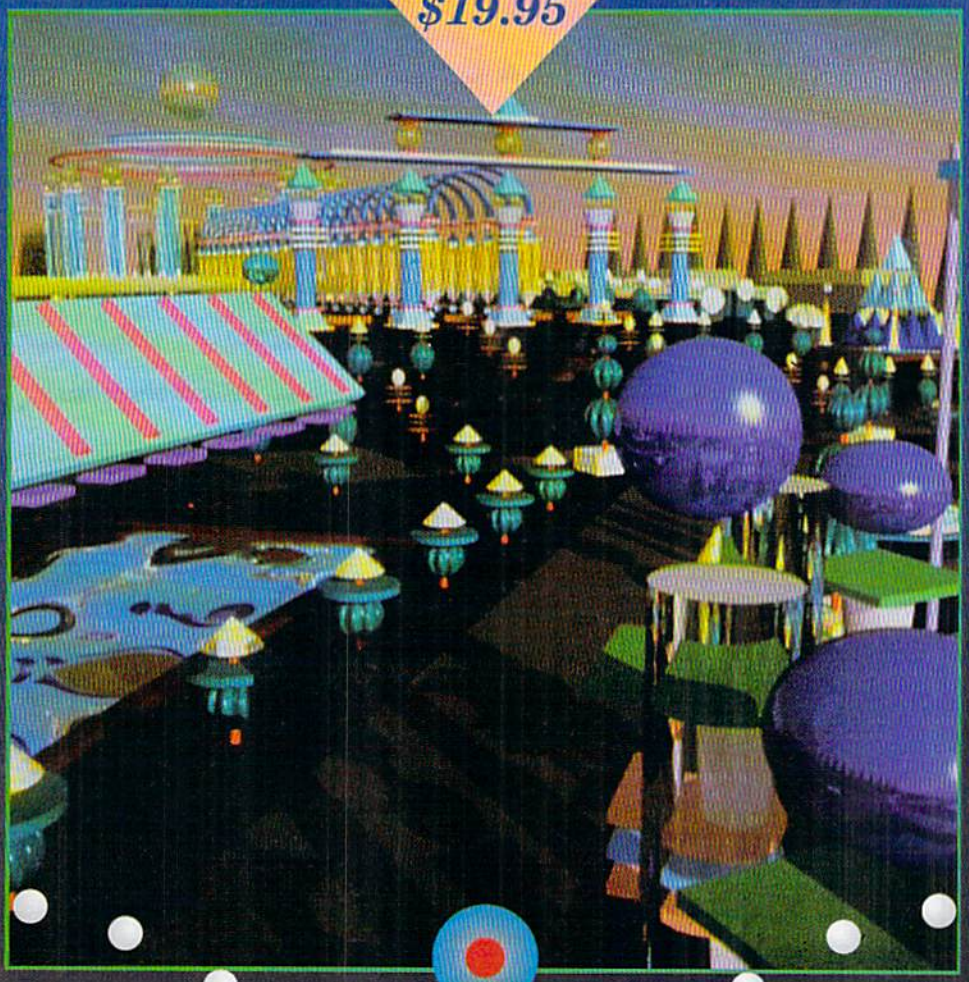

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prompt. The unpacked files are written to disk as File A, File B, and so on.

Regardless of which unpacking method you choose, the packing routine is based on repetition, so it works best with sprite files, picture files and program-format word processing files, such as those created by *RUN*'s word processor, RUN Script.

Basic programs can't be the last ones packed. That is, you must make either a machine language or text file last. If you experience problems unpacking files, repack them using different addresses or simply in a different order.

File Packer 64 is sure to come in handy any time you need to compact and protect your files. R

Steve Emsley is from Philadelphia and has been writing C-64 programs since 1984.

Listing 1. File Packer 64 program. (Available on the January/February ReRUN disk. To order, call 800-343-0728.)

```
10 IFPEEK(49171)<>207THENX=PEEK
   (186):LOAD"PACKER.ML",X,1
                          :REM*61
20 POKE53280,.:POKE53281,.:DR=8
   :DW=8:UP$="UNPACKER":TY$(.)=
   "NEW"                  :REM*221
30 TY$="PACKED"           :REM*142
40 PRINTCHR$(142)"{SHFT CLR}{5
   CRSR DNs}{CTRL 8}{CTRL 9}"SP
   C(7)"{27 SPACEs}"      :REM*166
50 PRINTSPC(7)"{CTRL 9}{8 SPACE
   s}FILE PACKER{8 SPACEs}{CTRL
    3} "                  :REM*160
60 PRINTSPC(7)"{CTRL 8}{CTRL 9}
   {27 SPACEs}{CTRL 3} ":REM*56
70 PRINTSPC(7)"{CTRL 8}{CTRL 9}
   {6 SPACEs}BY STEVE EMSLEY{6
   SPACEs}{CTRL 3} "      :REM*64
80 PRINTSPC(7)"{CTRL 8}{CTRL 9}
   {27 SPACEs}{CTRL 3} ":REM*36
90 PRINTSPC(8)"{CTRL 3}{CTRL 9}
   {27 SPACEs}"           :REM*177
100 PRINT"{2 CRSR DNs}{2 CRSR R
    Ts}{CTRL 2}1.{2 SPACEs}SAVE
     UNPACKER{CRSR DN}":PRINT"{
    2 CRSR RTs}2.{2 SPACEs}PACK
     FILE(S){CRSR DN}"    :REM*92
110 PRINT"{2 CRSR RTs}3.{2 SPAC
    Es}APPEND";           :REM*101
120 PRINT" FILE(S){CRSR DN)":PR
    INT"{2 CRSR RTs}4.{2 SPACEs
    }END{CRSR DN}":PRINT"{8 CRS
    R RTs}{CTRL 4}S -SOFTWARE D
    RIVE CHANGE"          :REM*230
130 PRINT"{2 CRSR DNs}{8 CRSR R
    Ts}{COMD 7}DIRECTORY{4 SPAC
    Es}S/D{4 SPACEs}F5/F7";
                          :REM*87
140 PRINT"{HOME}{2 CRSR DNs}{2
    CRSR RTs}{COMD 1}READING -"
    DR"{CRSR LF} "        :REM*210
150 PRINT"{CRSR UP}{25 CRSR RTs
    }WRITING -"DW"{CRSR LF} "
                          :REM*236
160 PRINT"{CRSR UP}{17 CRSR RTs
    }F1/F3                :REM*48
170 GETA$:IFA$=""THEN170:REM*75
180 IFA$="1"THENSYS49396:GOTO28
    0                     :REM*204
190 IFA$="2"THENFF=.:GOTO500
                          :REM*153
200 IFA$="3"THENFF=1:GOTO500
                          :REM*197
210 IFA$="4"THENPRINT"{SHFT CLR
    }":END                :REM*142
220 IFA$=CHR$(135)THEN910
                          :REM*83
230 IFA$=CHR$(136)THEN950
                          :REM*140
240 IFA$=CHR$(133)THEN970
                          :REM*131
250 IFA$=CHR$(134)THEN990
                          :REM*214
260 IFA$="S"THEN1010      :REM*238
270 GOTO170               :REM*93
280 RL=.:INPUT"{SHFT CLR}{2 CRS
    R DNs}{2 CRSR RTs}{CTRL 2}S
    TORE WHERE IN MEMORY";RL:IF
    RL<828ORRL>53248THENRL=5229
    2                     :REM*184
290 PRINT"{2 CRSR DNs}{2 CRSR R
    Ts}{CTRL 8}RELOCATING{CTRL
    4}":I=49920           :REM*235
300 J=RL+64:GOSUB1090:POKEI+107
    ,L:POKEI+108,H:POKEI+217,L:
    POKEI+218,H           :REM*241
310 J=RL+219:GOSUB1090:POKEI+10
    4,L:POKEI+105,H:POKEI+206,L
    :POKEI+207,H          :REM*77
320 J=RL+238:GOSUB1090:POKEI+75
    ,L:POKEI+76,H:POKEI+96,L:PO
    KEI+97,H              :REM*250
330 POKEI+212,L:POKEI+213,H:J=J
    +1:GOSUB1090:POKEI+22,L:POK
    EI+23,H               :REM*120
340 POKEI+34,L:POKEI+35,H:POKEI
    +42,L:POKEI+43,H:POKEI+82,L
    :POKEI+83,H           :REM*164
350 POKEI+196,L:POKEI+197,H:POK
    EI+203,L:POKEI+204,H
                          :REM*129
360 J=J+1:GOSUB1090:POKEI+93,L:
    POKEI+94,H:POKEI+101,L:POKE
    I+102,H               :REM*112
370 J=J+1:GOSUB1090:POKEI+11,L:
    POKEI+12,H:POKEI+137,L:POKE
    I+138,H               :REM*200
380 J=J+1:GOSUB1090:POKEI+28,L:
    POKEI+29,H:POKEI+47,L:POKEI
    +48,H:POKEI+110,L     :REM*33
390 POKEI+111,H:J=J+1:GOSUB1090
    :POKEI+52,L:POKEI+53,H:POKE
    I+147,L:POKEI+148,H:REM*101
400 J=J+1:GOSUB1090:POKEI+57,L:
    POKEI+58,H:POKEI+154,L:POKE
    I+155,H               :REM*132
410 J=J+1:GOSUB1090:POKEI+62,L:
    POKEI+63,H:POKEI+163,L:POKE
    I+164,H               :REM*90
420 J=J+1:GOSUB1090:POKEI+117,L
    :POKEI+118,H:POKEI+173,L:PO
    KEI+174,H             :REM*86
430 J=J+1:GOSUB1090:POKEI+122,L
    :POKEI+123,H:POKEI+180,L:PO
    KEI+181,H             :REM*224
440 PRINT"{2 CRSR DNs}"SPC(9)"I
    NSERT DISK, HIT A KEY":POKE
    198,.:J=RL:GOSUB1090:REM*81
450 GETA$:IFA$=""THEN450:REM*86
460 IFA$="{LEFT ARROW}"THENE1=1
    :GOTO400              :REM*241
470 OPEN1,DW,15,"I":CLOSE1
                          :REM*113
480 OPEN9,DW,1,UP$:PRINT#9,CHR$
    (L);CHR$(H);:FORK=4992ØTO5Ø
    170                   :REM*154
490 PRINT#9,CHR$(PEEK(K));:NEXT
    :CLOSE9:GOTO400       :REM*49
500 OF$="":INPUT"{SHFT CLR}{COM
    D 3}{2 CRSR DNs}{2 CRSR RTs
    }NAME OF FILE";OF$:IFLEN(OF
    $)>16THEN500          :REM*14
510 IFOF$=""THEN400       :REM*187
520 NF$="":PRINT"{CRSR DN}{2 CR
    SR RTs}{COMD 6}NAME OF "TY$
    (FF)" FILE";:INPUTNF$
                          :REM*48
530 IFLEN(NF$)>16THENPRINT"{3 C
    RSR UPs}":GOTO520     :REM*172
540 IFNF$=""THEN400       :REM*215
550 IFFFTHEN580           :REM*94
560 XB=.:INPUT"{CRSR DN}{2 CRSR
     RTs}{CTRL 8}XOR BYTE";XB:I
    FXB<.ORXB>255THENXB=.
                          :REM*241
570 POKE49391,XB          :REM*52
580 PRINT"{5 CRSR DNs}"SPC(8)"{
    COMD 7}INSERT DISK(S), HIT
    A KEY":POKE198,.:WAIT198,1
                          :REM*0
590 E1=.:OPEN1,DR,15,"I":INPUT#
    1,E1:CLOSE1:IFDR=DWTHEN610
                          :REM*219
600 E2=.:OPEN1,DW,15,"I":INPUT#
    1,E2:CLOSE1           :REM*84
610 IFE1<>.ORE2<>.THEN400
                          :REM*207
620 GOSUB720:IFE1THEN400:REM*149
630 IFFFTHENGOSUB830:GOTO710
                          :REM*114
640 OPEN8,DR,2,OF$:OPEN9,DW,1,N
    F$:SYS49152           :REM*62
650 PRINT"{CRSR DN}{CRSR RT}ANO
    THER FILE?{2 SPACEs}(Y/N)":
    POKE198,.             :REM*71
660 GETA$:IFA$="N"THEN400
                          :REM*130
670 IFA$<>"Y"THEN660      :REM*43
680 OF$="":INPUT"{SHFT CLR}{COM
    D 3}{2 CRSR DNs}{2 CRSR RTs
    }NAME OF FILE";OF$:IFLEN(OF
    $)>16THEN680          :REM*219
690 IFOF$=""THEN400       :REM*78
700 GOSUB720:IFE1THEN400:REM*197
710 OPEN8,DR,2,OF$:OPEN9,DW,3,N
    F$+",P,A":SYS49342:GOTO650
                          :REM*150
720 E1=.                  :REM*67
730 OPEN1,DR,15:OPEN8,DR,2,OF$:
    GET#8,L$,H$:INPUT#1,E1:CLOS
    E8:CLOSE1:L=.:H=.     :REM*161
740 IFE1THENRETURN        :REM*231
750 NL=.:L$=L$+CHR$(.):H$=H$+CH
    R$(.):L=ASC(L$):H=ASC(H$):N
    L=L+256*H             :REM*129
760 PRINT"{CRSR DN}{2 CRSR RTs}
    {CTRL 2}LOAD ADDRESS IS"NL"
    {CRSR LF}.{2 SPACEs}CHANGE
    IT?":POKE198,.        :REM*38
770 GETA$:IFA$="N"THEN810:REM*6
780 IFA$="{LEFT ARROW}"THENE1=1
    :RETURN               :REM*127
790 IFA$<>"Y"THEN770      :REM*166
800 INPUT"{CRSR DN}{2 CRSR RTs}
    NEW LOAD ADDRESS";NL:IFNL<.
```

```
    ORNL>65535THEN8ØØ    :REM*49
81Ø J=NL:GOSUB1Ø9Ø        :REM*8
82Ø POKE49393,L:POKE49394,H
                          :REM*134
83Ø PRINT"{CRSR DN}{2 CRSR RTs}
    {COMD 3}IS THIS A BASIC PRO
    GRAM?{2 SPACEs}({CTRL 9}Y{C
    TRL Ø}/{CTRL 9}N{CTRL Ø})":
    POKE198,.             :REM*19
84Ø GETA$:IFA$="Y"THENPOKE49395
    ,1:GOTO88Ø            :REM*254
85Ø IFA$="{LEFT ARROW}"THENE1=1
    :RETURN               :REM*181
86Ø IFA$<>"N"THEN84Ø      :REM*132
87Ø POKE49395,.           :REM*2Ø9
88Ø IFFF=.THEN9ØØ         :REM*161
89Ø OPEN8,DW,2,NF$:GET#8,A$:A$=
    A$+CHR$(.):XB=ASC(A$):CLOSE
    8:POKE49391,XB        :REM*1Ø1
9ØØ RETURN                :REM*22
91Ø POKE49778,DR:OPEN1,DR,15,"I
    ":INPUT#1,E1:CLOSE1:IFE1THE
    N4Ø                   :REM*148
92Ø PRINT"{SHFT CLR}{2 CRSR DNs
    }{CTRL 4}"SPC(5)"SHIFT KEY
    PAUSES, C= KEY STOPS{CRSR D
    N}":PRINTSPC(15)"HIT A KEY"
                          :REM*156
93Ø POKE198,.:WAIT198,1:SYS4966
    4                     :REM*65
94Ø PRINT"{CRSR DN}"SPC(14)"{CO
    MD 6}HIT A KEY...":POKE198,
    .:WAIT198,1:GOTO4Ø    :REM*97
95Ø POKE49778,DW:OPEN1,DW,15,"I
    ":INPUT#1,E1:CLOSE1:IFE1THE
    N4Ø                   :REM*52
96Ø GOTO92Ø               :REM*23
97Ø DR=DR+1:IFDR=12THENDR=8
                          :REM*19
98Ø GOTO14Ø               :REM*29
99Ø DW=DW+1:IFDW=12THENDW=8
                          :REM*111
1ØØØ GOTO14Ø              :REM*41
1Ø1Ø PRINT"{SHFT CLR}{CTRL 5}{2
     CRSR DNs}{2 CRSR RTs}CHAN
     GE DRIVE FROM";:INPUTD1:IF
     D1<8THEND1=8         :REM*84
1Ø2Ø IFD1>11THEND1=11      :REM*88
1Ø3Ø PRINTSPC(17)"TO";:INPUTD2:
     IFD2=D1THEN4Ø        :REM*5Ø
1Ø4Ø IFD2<8THEND2=8        :REM*124
1Ø5Ø IFD2>11THEND2=11      :REM*11Ø
1Ø6Ø PRINT"{2 CRSR DNs}{2 CRSR
     RTs}CHANGING DRIVE....":OP
     EN1,D1,15            :REM*189
1Ø7Ø PRINT#1,"M-W"CHR$(119)CHR$
     (.)CHR$(2)CHR$(32+D2)CHR$(
     64+D2):CLOSE1        :REM*39
1Ø8Ø FORI=.TO499:NEXT:GOTO4Ø
                          :REM*13
1Ø9Ø H=INT(J/256):L=J-256*H:RET
     URN                  :REM*248
```

Listing 2. Creates Packer.ML program. (Available on the January/February ReRUN disk.)

```
Ø REM THIS LIST 1 CREATES (AND
  SHOULD NOT BE CALLED) PACKER.
  ML                      :REM*89
5 OPEN 8,8,8,"PACKER.ML,P,W"
                          :REM*132
6 CT=Ø:PRINT"{SHFT CLR}":REM*56
1Ø READ A$:IF A$="-1" THEN CLOS
  E8:PRINT:PRINT"ALL DONE!":EN
  D                       :REM*129
12 PRINT"{HOME}READING LINE "+S
  TR$(CT):CT=CT+1         :REM*141
15 IF LEN(A$)<62 THEN 55
                          :REM*254
2Ø B$=MID$(A$,1,2Ø)+MID$(A$,22,
  2Ø)+MID$(A$,43,2Ø)      :REM*242
25 FOR I=1 TO 3Ø          :REM*181
3Ø C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                          :REM*2Ø9
35 H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55               :REM*85
4Ø L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55               :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);
                          :REM*67
5Ø NEXT:GOTO 1Ø           :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOT
  O 7Ø                    :REM*184
6Ø IF LEN(A$)<42 THEN B$=LEFT$(
  A$,2Ø)+RIGHT$(A$,(LEN(A$)-21
  )):GOTO 7Ø              :REM*176
65 B$=LEFT$(A$,2Ø)+MID$(A$,22,2
  Ø)+RIGHT$(A$,LEN(A$)-42)
                          :REM*14Ø
7Ø FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                          :REM*14Ø
8Ø H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55               :REM*56
85 L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55               :REM*84
9Ø BY=H*16+L:PRINT#8,CHR$(BY);
                          :REM*148
95 NEXT:GOTO 1Ø           :REM*16Ø
1ØØ REM HEX DATA FOR PACKER ML
                          :REM*233
1Ø1 DATA ØØC2Ø2ØDFC2Ø2Ø2D7CØADEF*C
    Ø2Ø2D2FFADF3CØ2Ø2D2FF*2ØCFC02
    ØCFFF2ØCFFF2Ø         :REM*159
1Ø2 DATA D7CØADF1CØ4DEFCØ2Ø2D2*F
    FADF2CØ4DEFCØ2Ø2D2FF*2ØCFC02
    ØCFFF8DEDC02Ø         :REM*156
1Ø3 DATA CFCØ2ØCFFFAA2ØB7FF8D*E
    EC08A8DECCØCDEDCØF0*44ADF0C
    0C9049Ø1E2ØA1         :REM*255
1Ø4 DATA CØ2ØE5CØ2ØDFCØADEECØ*F
    ØD52ØA1CØ2ØCCFFA9Ø8*2ØC3FFA
    9Ø94CC3FFADED         :REM*255
1Ø5 DATA CØC984FØDBC987FØD72Ø*D
    7CØADEDCØ4DEFCØ2Ø2D2*FFCEFØC
    ØDØF84C59CØEE         :REM*153
1Ø6 DATA FØCØF0034C5FCØCEFØCØ*4
    C56CØ2Ø2D7CØA9874DEF*CØ2Ø2D2F
    FADFØCØ4DEFCØ         :REM*2Ø5
1Ø7 DATA 2Ø2FFADEDCØ4DEFCØ4C*D
    2FF2ØDFCØ2Ø2D7CØA984*4DEFCØ2
    ØD2FF4CØCCØ2Ø         :REM*178
1Ø8 DATA CCFFA2Ø84CC6FF2ØCCFF*A
    2Ø94CC9FFA9Ø18DF0CØ*6ØADECC
    Ø8DEDCØ6ØØØØØ         :REM*2Ø0
1Ø9 DATA ØØØØØØØØØØØA2ØØBDØØ*C
    19DØØC3E8DØF76Ø2ØCØ*FFA9ØØ8
    DØEDCA5Ø18DF1         :REM*167
11Ø DATA C1A2Ø82ØC6FF2ØCFFF8D*E
    FC12ØCFFF8DF2C12ØCF*FF4DEFC
    185Ø32ØCFFF4D         :REM*55
111 DATA EFC185Ø4ADF2C1FØØD8D*F
    3C1A5Ø38DF4C1A5Ø48D*F5C12ØC
    FFFAACE2ØDØ2Ø         :REM*1Ø6
112 DATA B7FF8DEEC1EE2ØDØ8A4D*E
    FC1C987FØ68C984FØ11*8DFØC1A
    DEEC1DØ1CADFØ         :REM*95
113 DATA C12ØDBC14C4ØC1ADF2C1*F
    ØA6A5Ø38DF6C1A5Ø48D*F7C1A9Ø
    ØFØ982ØCCFFA9         :REM*69
114 DATA Ø82ØC3FFADF1C185Ø1A9*Ø
    18DØEDCADF3C1DØØ16Ø*38ADF4C
    1852BE9Ø1857A         :REM*179
115 DATA ADF5C1852CE9ØØ857B18*A
    DF6C169Ø3852DADF7C1*69ØØ852
    E2Ø6ØA64CEAA7         :REM*167
116 DATA 2ØCFFF4DEFC1AA2ØCFFF*4
    DEFC12ØDBC1CADØFAAD*EEC1DØA
    84C4ØC1AØ3484         :REM*249
117 DATA Ø1AØØØ91Ø3E6Ø3DØØ2E6*Ø
    4AØ3784Ø16ØØØØØØØØ*ØØØØØØØ
    ØØØØØØØØØØØØ         :REM*218
118 DATA ØØØØØØØA9932ØD2FFA9*Ø
    8AE72C2AØØØ2ØBAFFA9*Ø1A27ØA
    ØC22ØBDFF2ØCØ         :REM*166
119 DATA FFA2Ø82ØC6FF2ØE4FF2Ø*E
    4FF2ØE1FFFØ3C2ØE4FF*2ØE4FFA
    59ØDØ32AD8DØ2         :REM*1Ø7
12Ø DATA C9Ø2FØ2BC9Ø1FØF52ØE4*F
    F8D71C22ØE4FFAE71C2*2ØCDBDA
    92Ø2ØD2FF2ØE4         :REM*4
121 DATA FFFØØ62ØD2FF4C54C2A9*Ø
    D2ØD2FF4C26C22ØC9FF*A9Ø84CC
    3FF6Ø24ØØØ8           :REM*222
122 DATA -1               :REM*235
```

Listing 3. File Unpacker program. (Available on the January/February ReRUN disk.)

```
1Ø REM LISTING 3 - FILE UNPACKE
  R                       :REM*183
2Ø SYS57812"DECOMP.ML",8:POKE78
  Ø,.:POKE781,.:POKE782,192:SY
  S65493                  :REM*1ØØ
3Ø POKE5328Ø,.:POKE53281,.:PRIN
  T"{SHFT CLR}"           :REM*19
4Ø S1=49152:NN=4916Ø:AF=49184:W
  R=492Ø6:EO=4931Ø:LL=EO+1:LH=
  EO+2:LB=EO+3            :REM*14Ø
5Ø N$(Ø)="NO ":N$(1)="YES"
                          :REM*52
6Ø PRINT"{6 CRSR DNs}"SPC(13)"{
  CTRL 2}FILE RETRIEVER"
                          :REM*191
7Ø FR$="":INPUT"{3 CRSR DNs}{2
  CRSR RTs}INPUT PACKED FILE N
  AME ";FR$               :REM*251
8Ø IFFR$=""THENPRINT"{SHFT CLR}
  ":END                   :REM*2Ø4
9Ø OPEN1,8,15,"I0":OPEN8,8,2,FR
  $:INPUT#1,E,E$:CLOSE8:CLOSE1
                          :REM*19
1ØØ IFETHENPRINT"{2 CRSR DNs}{2
     CRSR RTs}DISK ERROR -"E;E$
  :FORI=.TO1499:NEXT:PRINT"{S
  HFT CLR}":END           :REM*155
11Ø OPEN8,8,2,FR$         :REM*155
12Ø PRINT"{SHFT CLR}":SYSS1:FC=
  65                      :REM*253
13Ø PRINT"{CTRL 2}{2 CRSR DNs}{
  2 CRSR RTs}{CTRL 2}EOR BYTE
  -{COMD 3}"PEEK(EO):REM*248 ►
```

```
14Ø POKE781,3:SYS65481 :REM*244
15Ø PRINT"{HOME}{5 CRSR DNs}{2
    CRSR RTs}{CTRL 2}START ADDR
    ESS - {COMD 3}"PEEK(LL)+(25
    6*PEEK(LH))"{CRSR LF}{3 SPA
    CEs}"                  :REM*82
16Ø PRINT"{CRSR DN}{2 CRSR RTs}
    {CTRL 2}FILE NUMBER -{COMD
    3}"FC-64               :REM*4Ø
17Ø PRINT"{CRSR DN}{2 CRSR RTs}
    {CTRL 2}BASIC FILE? - {COMD
    3}"N$(PEEK(LB))        :REM*18
18Ø F$="FILE "+CHR$(FC):FC=FC+1
                           :REM*193
19Ø SYSNN:OPEN9,8,1,F$:SYSWR
                           :REM*217
2ØØ CLOSE9:IFPEEK(LB)THENCLOSE8
    :PRINT"{SHFT CLR}":END
                           :REM*24
21Ø SYSAF:GOTO14Ø          :REM*97
```

Listing 4. Creates Unpacker.ML program. (Available on the January/February ReRUN disk.)

```
Ø REM THIS LIST 4 CREATES (AND
  SHOULD NOT BE CALLED) DECOMP.
  ML                       :REM*245
5 OPEN 8,8,8,"DECOMP.ML,P,W"
                           :REM*2Ø4
6 CT=Ø:PRINT"{SHFT CLR}":REM*56
1Ø READ A$:IF A$="-1" THEN CLOS
  E8:PRINT:PRINT"ALL DONE!":EN
  D                        :REM*129
12 PRINT"{HOME}READING LINE "+S
  TR$(CT):CT=CT+1          :REM*141
15 IF LEN(A$)<62 THEN 55
                           :REM*254
2Ø B$=MID$(A$,1,2Ø)+MID$(A$,22,
  2Ø)+MID$(A$,43,2Ø)       :REM*242
25 FOR I=1 TO 3Ø           :REM*181
3Ø C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                           :REM*2Ø9
35 H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55                :REM*85
4Ø L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55                :REM*136
45 BY=H*16+L:PRINT#8,CHR$(BY);
                           :REM*67
5Ø NEXT:GOTO 1Ø            :REM*115
55 IF LEN(A$)<21 THEN B$=A$:GOT
  O 7Ø                     :REM*184
6Ø IF LEN(A$)<42 THEN B$=LEFT$(
  A$,2Ø)+RIGHT$(A$,(LEN(A$)-21
  )):GOTO 7Ø               :REM*176
65 B$=LEFT$(A$,2Ø)+MID$(A$,22,2
  Ø)+RIGHT$(A$,LEN(A$)-42)
                           :REM*14Ø
7Ø FOR I=1 TO LEN(B$)/2:REM*221
75 C$=MID$(B$,(I*2)-1,2):H$=LEF
  T$(C$,1):L$=RIGHT$(C$,1)
                           :REM*14Ø
8Ø H=VAL(H$):IF H$>"9" THEN H=A
  SC(H$)-55                :REM*56
85 L=VAL(L$):IF L$>"9" THEN L=A
  SC(L$)-55                :REM*84
9Ø BY=H*16+L:PRINT#8,CHR$(BY);
                           :REM*148
95 NEXT:GOTO 1Ø            :REM*16Ø
1ØØ REM HEX DATA FOR LISTING 4
  OF PACKER 64             :REM*141
1Ø1 DATA ØØC Ø4C14C ØA2Ø84CC6FF*A
  2Ø94CC9FF2ØCFFF4D9E*CØ6Ø2ØC
  ØFF2ØØ3CØ2ØCF            :REM*138
1Ø2 DATA FF8D9EC Ø2ØØ3CØ2ØCFFF*8
  DA1CØ2ØØDCØ8D9FCØ2Ø*ØDCØ8DA
  ØCØ6Ø2ØØ8CØAD            :REM*163
1Ø3 DATA 9FCØ2ØD2FFADAØCØ2ØD2*F
  F2ØØ3CØ2ØØDCØ8DA2CØ*2ØB7FF8
  DA5CØADA2CØC9            :REM*184
1Ø4 DATA 87FØ15C984FØD62ØØ8CØ*A
  DA2CØ2ØD2FFADA5CØDØ*C84C45C
  Ø2ØØ3CØ2ØØDCØ            :REM*38
1Ø5 DATA 8DA4CØ2ØØ3CØ2ØØDCØ8D*A
  3CØ2ØB7FF8DA5CØ2ØØ8*CØADA3C
  Ø2ØD2FFCEA4CØ             :REM*69
1Ø6 DATA DØF2ADA5CØDØ9A4C45CØ*Ø
  ØØØØØØØØØØØØØØØ         :REM*191
1Ø7 DATA -1                :REM*218
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GEOWATCH

AutoExecs aren't just found in mahogany-lined Detroit offices; they live in your GEOS environment, too.

By STEVE VANDER ARK

A LOT OF THINGS HAPPEN when you boot GEOS. One simple Boot command sets into motion an elaborate sequence of events that transforms your Commodore into a new machine. By the time you see those icons spread across the deskTop and the pointer perched up in the corner, your computer has executed scads of commands and run several files—without a single prompt from you.

An awful lot of information has to be transferred, digested and interpreted before you can go zipping around the mousepad, so first GEOS supercharges the boot drive with disk turbo code. From then on, the rest of the GEOS operating system can be stuffed into memory pretty darn quickly. In the process, the built-in set of instructions that tell your Commodore how to do everything (from reading the drives to understanding Basic) is replaced with a new set of rules, the GEOS operating system.

After loading the system, your computer still has a few jobs to do before you see the deskTop. Since your hardware setup is unique, with drives, RAM expanders and so on, GEOS must get these details and modify itself accordingly. Configure is the file that knows the number and types of drives, RAM expanders and other peripherals you have in your system. At some point when you first used GEOS, you ran Configure and told it what peripherals you have on your computer. Now, whenever you boot GEOS, Configure runs automatically, reminding GEOS how your system is set up.

Configure is a special type of file called an autoexec, short for "automatic execute." During the boot routine, GEOS checks the disk files, then opens and runs any autoexecs it finds in the order they appear on the disk, just as if you'd double-clicked on them yourself.

Autoexec programs are perfect for doing those mundane tasks that you have to do each time you boot up (like configuring drives), and those clever GEOS programmers have written autoexecs for many of them. Probably the most common autoexec is the clock. Before the deskTop is drawn, a dialog box appears asking you to enter the time and date, and since there's no other way out of the box, you have to keep your clock updated (which is just great for forgetful people like me). There are a number of time-and-date autoexecs available; I use Rick Koch's AUTOCLOCK.

GEOS programmer Jean Major has come up with a different use for autoexec files. He's created a patch program that upgrades the GEOS DBGetFile routine, which lets you scroll through available files and select one to open. With the upgrade, the list of available files is no longer limited to 16 filenames. He made his patch an autoexec, so it updates GEOS automatically when you boot up. A text window appears briefly during the start-up sequence to let you know the program has done its job. I have the C-128 version, called DBGetFile128 v2.0.

One tedious job that autoexecs can do for you is load files into RAM. Unless you have a RAM unit that maintains power when your computer is off, such as the Quick Brown Box or RAMLink, you have to reload files every time you boot. While many of the files you choose will depend on your current project, some files are always needed—the deskTop, for instance—and an autoexec can load them for you.

One automatic loader is QWICKSTASH by John Howard. The program's customizing feature adds a little time to the boot procedure, but it requires no user input, making the whole process quite painless. QWICKSTASH works on the C-64 as well as the 128 (in 40-Column mode).

What makes a file an autoexec is not

GEOS File Types

IF YOU'RE FAMILIAR with the Basic disk directory, you're probably aware of up to four types of files: PRG (program), SEQ (sequential), REL (relative) and USR (user). On a GEOS disk, the Basic directory shows most GEOS files as the user type.

These file-type designations, really indicate only the structure of the file data as saved to disk. GEOS uses some sequential files (they're similar but not identical to the Commodore sequential file), but more often it uses its own unique file structure, called VLIR.

Within these general types, GEOS marks each file as of a specific type—a designation that tells GEOS what that file is used for. This file type is recorded in two places on the disk: in byte 69 of the file's header block and in byte 22 of the directory block.

The file header is a collection of information about the file, including the icon, the comments you see when using the Info command, the author's name, the time-and-date stamp, and other information GEOS needs. The directory block is similar to the directory of a non-GEOS disk, except it includes a few extra items of information and pointers to the header block.

Non-GEOS files on a GEOS disk do not include this extra information, but their directory listings are compatible with the GEOS operating system. Certain functions cannot be performed on a non-GEOS file, because the information GEOS needs is not available.

The following is a list of GEOS file types:

0 Not GEOS
1 Basic, with a GEOS header
2 Assembly language, with a GEOS header
3 Data file
4 System file
5 Desk accessory
6 Application
7 Application data
8 Font
9 Printer driver
10 Input-device driver
11 Disk device
12 System boot file
13 Temporary (swap) file
14 Autoexec file
15 128 Input-device driver

—SVA

special code or disk-access routines, as with a desk accessory; an autoexec's only distinguishing feature is its file-type indicator in the GEOS header. If you change any GEOS file's type to autoexec, it will run automatically when you boot. While this might suggest the possibility of opening your system directly into an application, in practice the limitations of the available memory get in the way.

The code for an autoexec is placed in memory before the entire boot sequence runs, which means that if the code is larger than a few kilobytes, it's going to overwrite essential operating system code and crash the system. Also, the printer and input drivers won't have loaded yet, so those functions will be left in Default mode (i.e., no printer and joystick input only).

A program called AutoLoader by Jim Collette provides a way around some of these difficulties. When this handy autoexec runs, it in turn loads and runs any other GEOS file you specify, even an application, as if that file were an autoexec itself. AutoLoader manipulates the memory so you can boot directly into an application. When used to run Batch Copier, a file copier routine also by Jim Collette, it will load predesignated files into your REU on boot-up.

As you combine various autoexecs on your disk, it's a good idea to test the boot routine frequently to make sure your system will still boot properly. If possible, always work from a backup copy of your system disk. Using the original disk is more than a little risky! Another problem cropped up when I used Maverick to create a double-sided boot disk. I found that autoexecs failed to work if parts of them were stored on the back of the disk.

With these cautions in mind, you'll find that autoexecs are remarkably handy tools for setting up your GEOS environment. Whether you're a geopainter, publisher, gamer or author, autoexecs can handle the chores, letting you jump right into the real fun! ■

Steve Vander Ark is from Grand Rapids, Michigan, and is a GEOS columnist for Compute's Gazette.

Program Sources

AUTOCLOCK
By Rick Koch
Crycket on Q-Link

AutoLoader
Batch Copier
By Jim Collette
GEOS Companion Disk
Available in the *RUN* area of Q-Link or by calling 800-373-0728.

DBGetFile
By Jean Major
JeanF.Major on Q-Link

QWICKSTASH (with QWIKPIK)
By John Howard
ILLINI70 on Q-Link
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128 Mode

Pull your 1351 mouse out of its hole and put it to work moving your cursor in 40-column mode.

By MARK JORDAN

UNLESS YOU USE GEOS, the 1351 mouse is probably a forgotten member of your Commodore family. Mine was. While the mouse on my Amiga has logged many miles, my 1351 has hibernated in the back of a desk drawer.

Sure, the 1351's driver is easy enough to load and use, but all it does is move a pointer the C-128 doesn't recognize. You may point, you may click, and if your 128 is in a good mood, it will ignore you; if it's not, off you go to Monitorland.

I've changed all that by rewriting the 1351's driver program. Now you can use your mouse to move your cursor. The new driver operates in 40-column mode and, like the original, it runs on interrupts, so it functions invisibly while you go about your normal business.

Type in the MouseCursor program in Listing 1, using the Checksum program on page 57 to catch any typing mistakes, and save it to disk. MouseCursor is a Basic program that pokes the machine language driver into place; saves the driver to disk with the name MouseCur.Bin; prepares a sprite pointer; and, finally, starts the driver.

If you want to install the machine language on other disks, simply load and run MouseCursor again. To use the mouse cursor, make sure your 1351 is plugged into port 1, then just enter BLOAD "MOUSECUR.BIN" followed by SYS 6144.

Moving the mouse moves a pointer around the screen, and pressing the mouse button places the cursor at the pointer's current location. If you hold the left button down while moving the mouse, the cursor dances along with you.

The pointer is the I-beam type (made famous by the Macintosh) that fits nicely between letters. The Mac's cursor also fits nicely between letters, but the C-128's does not. It lands on them. Thus, you'll find that the cursor and I-beam don't always line up precisely. Fortunately, this discrepancy serves more to show the difference between graphics- and text-based interfaces than to cause any practical difficulty.

So, what are the mouse cursor's applications? I've started using it while programming. Sometimes it's faster to grab Mr. Mouse and zip over the screen than it is to use the cursor keys. You can easily use the mouse cursor in a program. Just install it with the BLOAD and SYS mentioned above.

Here's an idea to work on. The computer sees the left mouse button as function key 8. My program blanks out F8 so you don't get the Monitor command Commodore assigned to F8 every time you click. How about redefining F8 so that a click initiates a whole sequence of characters?

A nifty definition I've used clears a program line from the cursor forward. The ESCAPE key sequence to do that is CHR$(27)+"Q". Now, when I move my mouse pointer to a particular location in an erroneous line and click, the rest of the line is deleted. Very handy!

You could define F8 to place a pair of quotes on the screen, move the cursor to the latter one, and kick the editor into Insert mode. Then, whatever you typed would appear between quotes—great for Data and Print statements.

In short, anything you can do with a function key you can do with a mouse, with the added convenience of fast cursor placement.

One caveat: The C-128 (like the C-64) has a quirk in the way it reads joysticks, mouse clicks and keyboards. Rapid clicking may print an unwanted character on the screen. The hi-tech way to deal with this is to access the system software, study memory maps, interpret arcane machine language code, and rewrite some routines in machine language. The lo-tech way around the problem is to click more slowly. I'm a low-tech kind of a guy; how about you? I thought so.

I hope you try MouseCursor. You may find that Mr. Mouse is also happier at your house plugged into your 128 than living in the back of a drawer. R

Mark Jordan keeps busy as a high school English teacher. After homework, he's a Commodore programmer and RUN *columnist.*

Listing 1. MouseCursor program. (Also available on the January/February ReRUN disk. To order, call 800-343-0728.)

```
Ø REM MOUSE CURSOR 128 - MARK J
  ORDAN                    :REM*48
1Ø FORT=6144TO641Ø:READA:POKET,
   A:NEXT                  :REM*84
2Ø BSAVE"MOUSECUR.BIN",BØ,P6144
    TO P6411               :REM*171
3Ø SYS6144                 :REM*14Ø
4Ø END                     :REM*168
1ØØ DATA 32,2Ø7,24,2Ø1,24,24Ø,2
    5,8,12Ø,173,2Ø,3,141,16,25,
    173,21,3,141,17        :REM*79
11Ø DATA 25,169,33,141,2Ø,3,169
    ,24,141,21,3,4Ø,96,216,173,
    126,17,2Ø8,51          :REM*3
12Ø DATA 173,25,212,172,18,25,3
    2,93,24,14Ø,18,25,24,1Ø9,21
    4,17,141,214,17        :REM*179
13Ø DATA 138,1Ø5,Ø,41,1,77,23Ø,
    17,141,23Ø,17,173,26,212,17
    2,19,25,32,93,24       :REM*53
14Ø DATA 14Ø,19,25,56,73,255,1Ø
    9,215,17,141,215,17,76,187,
    24,14Ø,21,25,141       :REM*161
15Ø DATA 2Ø,25,162,Ø,56,237,21,
    25,41,127,2Ø1,64,176,7,74,2
    4Ø,18,172,2Ø,25        :REM*145
16Ø DATA 96,9,192,2Ø1,255,24Ø,8
    ,56,1Ø6,162,255,172,2Ø,25,9
    6,169,Ø,96,234         :REM*4
17Ø DATA 24,173,23Ø,17,41,1,24Ø
    ,1,56,173,214,17,1Ø6,74,74,
    2Ø1,43,144,2,169       :REM*14Ø
18Ø DATA 42,168,173,215,17,74,7
    4,74,2Ø1,28,144,2,169,27,17
    Ø,2Ø2,2Ø2,2Ø2          :REM*225
19Ø DATA 2Ø2,224,Ø,16,2,162,Ø,2
    4,32,24Ø,255,96,234,173,1,2
    2Ø,41,16,2Ø8,9         :REM*111
2ØØ DATA 32,159,2Ø5,32,136,24,3
    2,111,2Ø5,1Ø8,16,25,234,162
    ,63,169,Ø,157,Ø        :REM*44
21Ø DATA 14,2Ø2,16,25Ø,169,27,1
    41,41,14,141,62,14,169,4,14
    1,44,14,141,47         :REM*2Ø4
22Ø DATA 14,141,5Ø,14,141,53,14
    ,141,56,14,141,59,14,173,21
    ,2Ø8,9,1,141,21        :REM*52
23Ø DATA 2Ø8,169,1,141,39,2Ø8,1
    69,Ø,141,7,16,173,21,3,96
                           :REM*25Ø
```

RUN it right: **C-128; 1351 mouse in port 1**

COMMODORE CLINIC

Getting the right peripherals can be a challenge. This issue, learn about printers, modems and CP/M cartridges.

By ELLEN RULE

Q *I recently purchased a Star NX-1000C printer for my Commodore 64. Whenever I print out a document with GEOS 2.0, I lose the entire right side of the document. I am using the Star 1000C driver included with GEOS. I have looked through the printer manual and found that the Star 1000C can print 80-dpi graphics, which is what I assume I need. Why isn't my printer printing 80 dpi? I have tried all manner of combinations of dip switches and all kinds of settings, but nothing seems to help. Do I need to buy an interface so I can use the 80 dpi? Is there any way to get around having to buy an interface without sacrificing the right side of the document?*

—CAMERON GOBLE
ALBUQUERQUE, NM

A Your NX-1000C is performing the way it was designed to when it is plugged directly into the computer: It is emulating Commodore's direct-connect printers. These are 60-dot-per-inch printers and will produce the same results as your printer using the same software. A printed line on a 60-dpi printer will have up to 480 dots (60 dots × 8 inches), while an 80-dpi printer will have up to 640 dots (80 dots × 8 inches).

When a program such as GEOS sends a line of information to be printed, a 60-dpi printer will attempt to print the total number of dots it has been instructed to print (i.e., up to 640 dots), but it runs out of room on the 8-inch page at 480 dots. This is why the right side of the document is "lost."

To print the document, GeoWorks customer service advises the following:

- In geoWrite, set the margins to 1.2 inches and 6–7.2 inches.
- In geoPaint, fill only the left ¾ of the page.
- In geoPublish, set the right-hand guideline at 6 inches.

To get 80-dpi output, I'm afraid you'll have to purchase a printer interface and run your printer in the Epson-Compatible mode. This will give you a denser printed image and a slight difference in the width-to-height ratio, called the "aspect ratio." An image printed at 80 dpi will appear narrower because the dots are closer together, and you may find that regular geometric shapes, such as circles and squares, appear more true than those printed at 60 dpi.

Your printer manual will direct you regarding the proper DIP switch settings on your printer for Epson mode.

Q *My Commodore 1526 printer works perfectly, but I cannot find any graphics software to use with it. Why will it print letters with my word processor but not graphics with programs such as Print Shop, GEOS and the OCP Art Studio? I was told that I could replace the ROM chip to print graphics. Is there a way to make this printer work like the MPS 801 or 803?*

—DAVID KORNFEIND
GERMAN VALLEY, IL

A Different printers use different internal codes to produce the printed page. While Commodore gave the 1526 and MPS 802 printers the same text codes as the 1525 and MPS 801 printers, they did not give them the same graphics codes. Unfortunately, Commodore reverted back to their original system for subsequent printers. With an eye to maximizing profit, software developers naturally aligned their products to suit the greatest installed base, that is, the 801/1525-compatible printers.

However, many software companies have recognized the needs of users like you. On the back side of the graphics disks, Print Shop has a separate set of 2-block graphics that are made specifically for use with the 802/1526 printers. In addition, check your software manuals for an "install printer" option, which is how you tell your software to use the 802/1526 graphics codes.

Unfortunately, I do not know of a chip upgrade that will make your printer 801/1525 compatible.

Q *I have heard that there was a CP/M cartridge for the C-64. Is it any good? Are there any disk-based CP/M operating systems for the 64?*

—KEVIN GALAZEN
DULUTH, MN

A Commodore developed the CP/M cartridge for the 64 to attract people using CP/M in business. Even with the portable SX-64, however, the C-64 system failed to break into the business world sufficiently to make the cartridges profitable. They are no longer being manufactured, but you might find one through a user's group, a computer flea market or the used section at a Commodore dealer.

Many 128 owners have enjoyed using CP/M. If CP/M compatibility would be useful to you, you might want to investigate that option. Most user's groups have public domain CP/M libraries and CP/M users there could give you specific details.

Q *I have a C-128 and an AT&T 4000 modem. Can I use this modem if I purchase an Aprotek RS-232 interface, or is the AT&T incompatible with my computer?*

—PAUL GROSINGER
NEWFOUNDLAND, NJ

A There are two compatibility issues here: hardware and software. In general, an RS-232 interface can connect most any RS-232-type device (including modems) to your C-64. Check the AT&T 4000's manual to find out whether it is an RS-232 device; many modems are.

However, the modem could be physically compatible with the interface and still not understand your software's command set. Different modems understand different command sets. Your telecommunications software might use a command set that is compatible with Commodore's 1600, 1650 and 1670 modems, or perhaps the Hayes brand of modems, which follow the Commodore 64/128 standards. Check your modem's manual to see if it is compatible with any of these.

For your AT&T 4000 to work with your Commodore and that interface, the modem has to: 1) be an RS-232 device; 2) be able to understand one of the command sets listed above; and 3) have a terminal program that uses the same command set. ■

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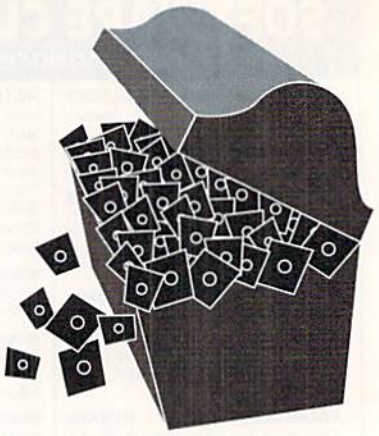

AMAZING SPIDER-MAN: In the paper plates from Mars, you can jump to the platform. To do so, stand on the edge. The platform will be about halfway up. Jump at an angle and shoot a web. With a little practice, you can make the jump each time.

When you are in the bottom of the mission control, you can skip about six levels by doing this: Kneel on the small bump at the bottom. Push and hold to the right. When you get stuck between the switch and the ceiling in the weighing room, jump to the left and shoot a web into the upper-left corner. You'll pass through the ceiling and several levels as well!

—RYAN RUEL
BARRINGTON, NH

BAAL: Here are useful access codes: level 2, FWFJVVIE; level 3, HWOLUSIM; level 4, IWPFYSIO. Make sure you have at least four Time Warriors before going into level 4. If you don't have enough, just keep destroying monsters and refueling to gain extra men. To destroy Baal, just move your Time Warriors as close to it as possible and fire at it continuously.

—LIANG YI
BROOLKYN, NY

BACK TO THE FUTURE, PART II: You can pass levels 2 and 4 by waiting until the time runs out and selecting NO when you're asked if you want another game. The computer will load the next level.

—BRIAN SMITH
OMAHA, NE

BEYOND ZORK: To gain dexterity in the 128 version of this game, squeeze the moss in the wine cellar. Once you've done that you can climb the crates to get the wine bottle.

To read the runes on the amulet, read them through the wine bottle. The onion you get from the cook can be used to blind the dornbeast; cutting it causes the beast's 69 eyes to water, allowing you to grab the sea chest.

LIGHTNING is the answer to the riddle near the lighthouse, and YOUTH is the solution to the riddle in the forest.

—WENDY CHENG
PLYMOUTH, MN

CARMEN SANDIEGO SERIES: Did you lose the almanac that came with this game? Try using a set of encyclopedias! Use the F volume to look up flags, and so on. It works great!

—JEFF JONSSON
SURREY, BRITISH COLUMBIA

CASTLEVANIA: On level 2, get the boomerang from one of the candles. It is more powerful than the dagger and if you catch it, it gives your heart back. On the first screen of this level, break the two blocks on top of the stairway, then walk in. A crown will appear on the screen. On the second screen, stand on the first raised blocks you come to and wait. A chest will appear, worth about 2000 points.

—STEVEN OCEPEK
AKRON, OH

DRAGON WARS: The party should stay in Purgatory until they have armor and weapons from the Arena. They should also get some scrolls from the Magic Shop. When exploring an area it is usually wise to check every square, because there are many items that can be found this way. In Mystic Wood, Enkidu can be summoned by blowing his horn. A strong character should wrestle him to gain Druid magic.

Magic boots can be earned by stopping a mud flow with a Create Wall spell in the City of Yellow Toad. These boots can get the party onto the island in Mystic Wood. In the Smuggler's Cove, a character must use his or her bureaucracy skill (and some gold) to see the pirates. The party should kill the pirates, because their boat is necessary for travel to the outer islands.

In Freeport, don't bother trying to get the Sword of Freedom, because it isn't there. Any attempt to take the false sword will kill the character who touches it. If the party has received the Dragon Gem from the dragon in the Lansk Undercity, it should go to the Dragon Valley. While there, the party should get several dragons' teeth and secure the Dragon Queen as an ally.

—TIM MORIARITY
EAST MOLINE, IL

FLIGHT SIMULATOR: Here's an easy way to land on the threshold at the start of the runway. First, line the threshold up on the bottom center of your windscreen. If it appears to move up the windscreen, you are descending too fast; add power slightly until the threshold seems to stay in one place. The plane will practically fly itself onto the runway.

As you enter the last leg of your approach, make sure your landing gear is down. Keep an eye on the altimeter to make sure you have enough altitude. Be sure you are aimed directly at the runway. When you're about 30 feet above the runway, slowly begin pulling back on the joystick. When the plane slows down and its nose drops, pull back slightly on the joystick. You'll have another (or your first) happy landing.

—HALIS SANTANA
BROOKLYN, NY

GARY KITCHEN'S GAMEMAKER: This is a great program for making games, but don't overlook the fact that it's also great for making graphic presentations. You can connect your computer to a VCR and make introductions to your videos or home movies. Since the SceneMaker and all other programs can be accessed from within the editor, you can make your presentations with a minimum of unproductive fumbling.

First, program your presentation to wait for joystick movement before starting. That gives you control over the starting time, so you can get your VCR ready. When assembling the presentation, decide on a basic idea, then experiment. Draw the scene for the background, then ►

RUN's Checksum & Program Typing Hints

TYPE IN *RUN*'S CHECKSUM, which serves for both the C-64 and for the C-128 in either 40- or 80-Column mode, and save it to disk before running it. When typing in a program from *RUN*, first load and run *RUN*'s latest version of the Checksum program, which contains a new feature explained below. The screen will display a SYS number (49152 for the C-64; 3328 for the C-128) that deactivates and reactivates the Checksum. Always disable *RUN*'s Checksum before attempting to run another program. Note: You can abbreviate Basic keywords; spaces affect the checksum only when within quotes; and the order of characters affects the checksum.

When you press return after typing in a program line, a one-, two-, or three-digit number from 0 to 255 appears in the home position. If this number matches the checksum value in the program listing, the line as you typed it is correct. If the number that appears doesn't match the checksum value, compare the line with the magazine listing to find your error. Then move the cursor back up to the line and make your corrections. Now, after you press return, the correct checksum value should appear. Continue entering the listing until all the lines have been correctly typed. Then deactivate *RUN*'s Checksum, using the appropriate SYS number, and save the finished program.

We sometimes get letters and phone calls from new readers who have typed in the Checksum program for the first time. They are confused by the "Out of Data Error in Line 30" message that appears when they try to run the Checksum program. Understandably, they compare line 30 of the listing with line 30 as they typed it in, and cannot find anything wrong. The message unintentionally misleads them into thinking the error is in line 30, whereas the typing mistake is actually somewhere in one of the Data statements in lines 190–350.

So, we've added a new feature to the Checksum program that alerts readers to the number of the Data statement line in the Checksum program where an error has actually been made. **Note that this feature works *only* on the Checksum program itself, and not on any other program listing in *RUN*.**

After you've entered and saved the Checksum program to disk, run it. If you've made any errors in any of the Data statements, the program will give you a specific line number. Find the mistake, correct it, press return, save the program and run it again. Repeat this procedure until the Checksum program runs flawlessly.

Control Characters Demystified

All the graphics and control characters in the listings in *RUN* have been translated into understandable key combinations. They are the instructions you see inside the curly braces. For example, {SHIFT L} means you hold down the shift key while you press the L key once. You do *not* type in the curly braces. What appears on the screen will look quite different from what is designated inside the braces. Here are some more examples:

{22 SPACES}—press the space bar 22 times.

{SHIFT CLR}—hold down the shift key and press the clr-home key once.

{2 CRSR DNs}—press the cursor-down key twice.

{CTRL 1}—hold down the control key and press the 1 key.

{COMD T}—hold down the Commodore logo key and press the T key.

{5 LB.s}—press the British pound key (£, *not* #) five times.

Refer to the following paragraphs for any other Error messages you get from running any program listing in *RUN*.

Other Error Messages

Having heard from many users over the years about their difficulties with typing in listings, we've identified a few recurring problems that plague many people but are easy to fix. So read on and see if your problem is one of these.

- You get an "Out of Data in Line xxx" message. This means that a program line was reading from Data statements and reached the end of the data before it was done reading. There are two possible problems.

One might be with the program line that reads the data, usually a For-Next loop. Make sure you have the proper values for the loop, because if, for example, the listing has a loop of 0 to 150, and you've typed 0 to 160, you'll get the Out of Data message. If the loop is correct, then the problem lies in the Data statements themselves. One possibility is that you omitted a whole line of data. That's easy enough to find and correct. It's more likely that you've skipped one or more individual data items or typed in a period instead of a comma, which causes two data values to be read as one number. Check your typing carefully against the listing. Using *RUN*'s Checksum program when you type in listings from the magazine should help in this case.

- You get an "Illegal Quantity Error in Line xxx" message. This means you've read a number from a Data statement and tried to poke it into a memory address. The error occurs because the number is larger than 255 (the largest value a memory address can contain), which means that somewhere in your Data statements you've made an error by typing in a number larger than 255. Again, this is easy to check for and correct. First look in your Data statements for a number larger than 255. You might have added an extra digit, or perhaps you ran two numbers together (23456 instead of 234,56).
- You get a "Syntax Error in Line xxx" message. This could be almost anything. What it tells you is that there is something wrong in the indicated line. Usually you've misspelled a Basic keyword or omitted some required character. List the line and examine it carefully.
- You get an "Error in Data" message. This occurs in programs that add up all the data as read, and, when finished, compares that sum with what it should be if the data were typed in correctly. If it isn't the same, it means an error somewhere in typing the Data statements. Go back and check the data carefully. Correct the mistake(s), save the new version and try again.
- Finally, we urge everyone who intends to type in one of our listings to use *RUN*'s Checksum program, which will help you avoid every mistake we've mentioned above, except that it won't detect the omission of a line. R

Listing. *RUN*'s Checksum program. This program is available on *RUN*'s BBS for users to download.

```
10 REM RUN'S CHECKSUM 64/128 - BOB KODADEK
20 MO=128:SA=3328:IF PEEK(4096)THEN MO=64:SA=49152
30 I=0:CK=0:CH=0:LN=190
40 FOR K=0 TO 16
50 FOR J=1 TO 10:READ B:IF B>255 THEN GOTO 170
60 CH=CH+B:POKE SA+I,B:I=I+1:NEXT
70 READ LC
80 IF LC<>CH THEN GOTO 170
90 CH=0:LN=LN+10
100 NEXT K
110 POKESA+110,240:POKESA+111,38:POKESA+140,234
120 PRINTCHR$(147)STR$(MO)" RUN CHECKSUM":PRINT
130 PRINT"TO TOGGLE ON OR OFF, SYS"SA:IF MO=128 THEN 1
    60
140 POKESA+13,124:POKESA+15,165:POKESA+25,124:POKESA+2
    6,165
150 POKESA+39,20:POKESA+41,21:POKESA+123,205:POKESA+12
    4,189
160 POKESA+4,INT(SA/256):SYS SA:NEW
170 PRINT"YOU HAVE A DATA ERROR IN LINE ";LN;"!":END
180 REM DO NOT CHANGE THESE DATA STATEMENTS!
190 DATA 120,162,24,160,13,173,4,3,201,24,884
200 DATA 208,4,162,13,160,67,142,4,3,140,903
210 DATA 5,3,88,96,32,13,67,152,72,169,697
220 DATA 0,141,0,255,133,176,133,180,166,22,1206
230 DATA 164,23,134,167,132,168,170,189,0,2,1149
240 DATA 240,58,201,48,144,7,201,58,176,3,1136
250 DATA 232,208,240,189,0,2,240,42,201,32,1386
260 DATA 208,4,164,180,240,31,201,34,208,6,1276
270 DATA 165,180,73,1,133,180,230,176,164,176,1478
280 DATA 165,167,24,125,0,2,133,167,165,168,1116
290 DATA 105,0,133,168,136,208,239,232,208,209,1638
300 DATA 169,42,32,210,255,165,167,69,168,170,1447
310 DATA 169,0,32,50,142,169,32,32,210,255,1091
320 DATA 32,210,255,169,13,32,210,255,104,168,1448
330 DATA 96,104,170,24,32,240,255,104,168,96,1289
340 DATA 56,32,240,255,138,72,152,72,24,162,1203
350 DATA 0,160,0,32,240,255,169,42,208,198,1304
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do the sprites and any sound or music you need. Finally, create the program in the editor and make it self-running.

—LANCE DEMELLO
ELK GROVE, CA

KINGS OF THE BEACH: When setting your teammate up for a spike, get directly behind him. If the spike gets blocked back to your side. You'll be in a very good position to dig the return.

On offense, don't always try to spike the ball. Dink it now and then, and you'll often dink for a winner.

—VICTOR R. HEREDIA
EL PASO, TX

SKY SHARK: The key to this game is to swerve through the gunfire and hold down the fire-button. Remember, your ammo is unlimited but your bombs are not. Save the bombs for the super tanks, which you should always hit in the center.

—JOHN HULSMAN
JASPER, IN

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RUN

STREET FIGHTER: Here's a tip for a hidden practice mode within the game. First, get to the opponent you cannot defeat. Turn the disk over to side two, which is blank. After you are defeated, a false loading to the menu should occur, and the background of the current level will remain on the title screen. Just press the joystick button to continue on the current boss!

—JOHN HULSMAN
JASPER, IN

STRIKE ACES: To get a little bit of extra firepower with the Tornado, select auto-arm. The wings will be loaded with Mavericks, and the bomb bay will have four bombs. That's two additional bombs! (If you load the weapons the regular way, you can have only two bombs.)

The manual says that if time is critical, you should climb higher to pick up speed. This is true. At 50,000 feet (the highest you can go), with the speed set at zero and no afterburners, you can reach around 900 knots. If you do this to save time or to shorten a trip, be sure you come down in time to set up your bombing run.

The MIG 27 is a maneuverable plane that carries few weapons. I find that the Kerry doesn't fire. The F-111F carries the most bombs and missiles but has no cannon.

—MATTHEW ALIBERTI
LEWISTON, ME

TEENAGE MUTANT NINJA TURTLES: Here's a way to give all your turtles their energy back. First, find a pizza and give it to one of your turtles. Save the game, then reload it and continue the saved game. The pizza you ate will have returned.

—THOMAS BONGIORNO
SHIRLEY, NY

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MEMORY BARRIER BUSTER—
No need for Commodore users to feel left out in the quest for megabytes of memory. Next issue we'll look at an REU upgrade modification that will give you the mega-memory you crave.

Fun Graphics Machine—
RUN takes the wraps off the latest version of this powerful, but little publicized program that lets you magically capture, manipulate and print out graphics.

Reviews—
The latest software releases, plus we review a small function chip for your C-128 that promises huge features.

Puck 'n' Play—
RUN's game developer extraordinaire unveils **Ricochet**, an air hockey game with a twist.

ReRUN Preview—
Here's the January/February lineup: **Mah Jongg**—Match tiles and solve the puzzle. **Graphic Calendar 64**—The most sophiscated calender *RUN* has ever published! **Hip Hop**—Tony Brantner's 3-D game is hoppin' fun. **File Packer 64**—Compress and encrypt your files. **Mouse Cursor 128**—Put your C-128's mouse to work positioning the cursor. **Murder Mansion 128**—Solve the mystery in this who-dunnit game. **Multi-Formatter**—Format up to four drives on your Commodore. **Plus more!**

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Rapid City, SD 57709-1191

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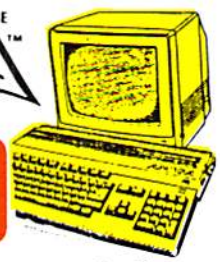

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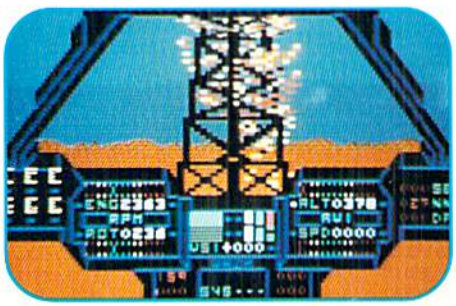

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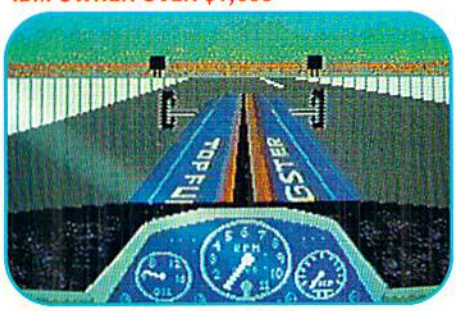

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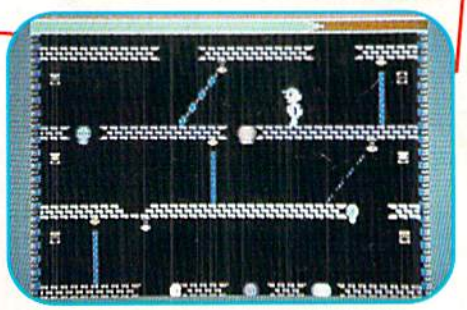

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